

*Multifunction Products*

# *SuperPak*™



*User's Manual*



**SuperPak™**  
**Utility Software**  
**for AST Premium™,**  
**IBM Personal Computers,**  
**Personal System/2™,**  
**and Fully-Compatible Computers**

User's Manual  
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## **NOTES**

## INTRODUCING SUPERPAK

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SuperPak™ is a collection of memory resident programs that take advantage of your AST board's special features. SuperPak software enables you to use the clock/calendar on boards like SixPakPlus®, install random access memory (RAM) disks and print spoolers on extended memory boards like Advantage® /2 and Advantage/2-386, and run expanded memory software on expanded memory boards like Rampage® /2, Rampage 286, and Rampage/2-286.

The SuperPak installation program (called INSTALL or ASTART, depending on the AST board), enables you to select basic configurations of your SuperPak utilities. For most applications, these configurations are all you ever need.

The SuperPak utilities can be modified for greater compatibility or to take advantage of their special features. You may do this by entering commands from the disk operating system (DOS) or by changing the statements in the AUTOEXEC.BAT and CONFIG.SYS files.

This manual will show you how to modify and use the SuperPak utilities. For basic installation instructions, see the *SuperPak Installation Supplement* or the *User's Manual* included with your AST board.

## Product Overview

The SuperPak utilities include these programs:

- The AST Expanded Memory software, which enables Expanded Memory Specification (EMS) and Enhanced Expanded Memory Specification (EEMS) application programs to use your board's expanded memory.
- SuperSpool™, a print spooling buffer that enables you to continue using your computer while your files print.
- fASTdisk™, a RAM disk that emulates a fixed disk drive. You may install up to two fASTdisks in your system, if memory permits.
- SuperDrive™, a RAM disk that emulates a diskette drive. This feature is available only for PC-, XT-, or AT-compatible computers.
- ASTCLOCK™, a clock/calendar program that keeps track of the time and date even when your computer is off. You can use ASTCLOCK for AST boards with clock/calendars.

## SuperPak Operation

SuperPak programs are memory-resident. Once you load them, they continue to work in memory as you use other applications. You can install these programs so they will be loaded each time you boot your system.

The SuperPak installation program copies the needed SuperPak program files onto your boot diskette and adds statements to the AUTOEXEC.BAT and CONFIG.SYS files on your boot diskette. If these files do not already exist, your installation program creates them.

AUTOEXEC.BAT is a batch file containing commands that are automatically executed when you start up your computer.

CONFIG.SYS contains the software drivers that allow devices external to your computer (such as the AST expanded memory software and fASTdisk) to function.

You can modify SuperPak statements in the AUTOEXEC.BAT and CONFIG.SYS files by editing them in a text editor or word processor. The program options listed in this manual enable you to configure the SuperPak utilities for greater compatibility and to use special features.

With SuperSpool and ASTCLOCK, you may enter commands from DOS while the computer is running. SuperSpool commands stop and start printing and clear out the print queue. ASTCLOCK commands enable you to set and change the time and display formats.

## NOTES

## **ABOUT THIS MANUAL**

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This manual will show you how to configure the SuperPak utilities for advanced applications. Part I, Using SuperPak, provides instructions and examples of SuperPak configurations. Part II, Appendices, provides background technical information.

For instructions on using the installation program to configure and install SuperPak utilities, see the *SuperPak Installation Supplement* included with your AST board.

### **How to Find Information**

*For information on compatibility and system requirements:*

Section 1 provides important considerations for installing SuperPak utilities.

*To configure and use fASTdisk:*

Section 2 shows you how to modify the fASTdisk configuration and use it with overlay software.

*To configure and use SuperSpool:*

Section 3 gives you instructions on configuring SuperSpool and lists the commands to control printing.

*To configure and use SuperDrive:*

Section 4 shows you how to configure SuperDrive to emulate different types of drives.

*To use ASTCLOCK:*

Section 5 explains how to use ASTCLOCK to set and configure the AST board's clock/calendar. You only need to read this section if your computer has an AST board with a clock/calendar.

*To use SuperPak utilities together:*

Section 6 provides important considerations for using SuperPak utilities together.

*For allocating memory:*

Appendix A gives suggestions on using SuperPak utilities with different memory configurations.

*For instructions on creating AUTOEXEC.BAT and CONFIG.SYS files:*

Appendix B shows how to create and modify the AUTOEXEC.BAT and CONFIG.SYS files.

*For instructions on patching DOS to support additional disk drives:*

Appendix C tells you how to modify DOS to support additional disk drive designations. This is useful if you are using fASTdisk and SuperDrive.

*For instructions on using the installation program:*

The *SuperPak Installation Supplement* gives detailed instructions on using your SuperPak installation program.

*For information on using the expanded memory software:*

The user's manual for your AST board explains how expanded memory software works and how to modify it, if necessary.

## Format Notation

The following format notation is used in this manual:

- *Boldface characters* indicate information you enter.
- *Uppercase characters* indicate items (such as commands) that you enter as shown. You may type either upper- or lowercase letters.

- *Lowercase characters* represent parameters you define. These parameters must satisfy the conditions of the command descriptions.
- *Angle brackets* (< >) tell you to press a key. For example, <**Esc**> means to press the Esc key. You will only press the Enter key when you see the instruction <**Enter**>.
- *Hyphens between keys* tell you to press them simultaneously. For example, <**Ctrl**>-<**Alt**>-<**Del**> tells you to hold down Ctrl and Alt while pressing the Del key.
- *Square brackets* ([ ]) indicate an optional term you may omit. Do not enter the brackets.
- *Color* indicates prompts and messages you see on the screen.
- A *leading zero* and *trailing lowercase "h"* indicate a hexadecimal number (for example, 02C0h).

## Related Documentation

This manual assumes you are familiar with your computer's hardware and DOS operating system. Refer to your computer's user and DOS manuals for more information.

## NOTES

## **PART I. USING SUPERPAK**

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1. Before You Begin
2. fASTdisk
3. SuperSpool
4. SuperDrive
5. ASTCLOCK
6. Using SuperPak Utilities Together

## **NOTES**

This section presents information you will need before you install SuperPak.

## 1.1 SuperPak Diskette Contents

In addition to the SuperPak utilities, there may be other software included on your SuperPak diskette. Information about each software product is contained in a file on the SuperPak diskette.

To display the file, boot your computer with DOS, place your SuperPak diskette (or a copy) in drive A and type the following command:

**README <Enter>**

Follow the instructions on the screen to view the information.

## 1.2 Compatibility and System Requirements

The minimum hardware requirements for installing SuperPak are an IBM-compatible computer with at least one diskette drive. SuperPak is compatible with DOS 2.0 and above.

## 1.3 What You Need to Know Before You Start

This section tells you what you need to know before installing SuperPak. A checklist appears in Section 1.3.1. Fill out the checklist as you answer each question.

Since SuperPak programs are memory-resident, the amount of memory installed in your system will determine which utilities you can use. Section 1.3.2 provides a general overview of memory requirements. For more detailed information, see Appendix A.

In most cases, you will be able to use the configurations provided by the SuperPak installation program. For some configurations, you may need to modify the SuperPak configurations. See Section 1.3.3 for information.

### A. *In what computer are you installing SuperPak?*

SuperPak is designed to work with AST Premium™ computers (Premium/286, Premium/386, and Premium Workstation), IBM® Personal Computers (PC, XT, and AT), IBM Personal System/2™ (PS/2™) computers (Models 25, 30, 50, 60, and 80), and compatible computers.

The type of computer and expansion boards you have determines the SuperPak utilities you can install. For example, SuperDrive is compatible with PC, XT, and AT computers, but not the PS/2.

For more information, refer to the user's manual for your AST board and the *SuperPak Installation Supplement*.

### B. *How much conventional memory is in the computer?*

Conventional memory is the memory up to 640 kilobytes (KB) that can be directly addressed by DOS.

*C. How much expanded and extended memory is in the computer?*

Memory above DOS's 640-KB limit can be used as extended or expanded. Extended memory is located above 1 megabyte (MB) and can be used by print spoolers and RAM disks (such as SuperDrive, fASTdisk and SuperSpool).

Expanded (or paged) memory swaps segments of memory (called pages) in and out of conventional and high memory. The expanded memory software included in SuperPak enables you to use paged memory.

You can use expanded memory with programs that meet EMS or EEMS specifications. Expanded memory can also emulate extended memory for RAM disks and print spoolers .

The SuperPak expanded memory drivers are compatible only with AST expanded memory boards. They are not compatible with boards from other manufacturers.

*D. Which boards are installed in your computer?*

Select SuperPak utilities appropriate for the expansion boards in your computer.

For computers with AST expanded memory boards (such as Advantage Premium or Rampage/2-286), run the SuperPak installation program to configure memory. To use fASTdisk, SuperSpool, and SuperDrive with expanded memory boards, allocate memory on the board as conventional and extended.

For computers with AST clock/calendar boards (like SixPakPlus), install ASTCLOCK. Do not use ASTCLOCK with other manufacturer's clocks (including the built-in clock for the AST Premium computers, IBM PC AT or IBM PS/2).

In order to use SuperSpool, your computer must have a printer port (either serial or parallel). If you have a serial printer, direct the output from a parallel to a serial port (Section 3).

*E. Which SuperPak utilities do you want to use?*

Install SuperPak utilities that are best suited for your computer's configuration.

If you have an AST expanded memory board, such as Rampage 286, Rampage/2, or Rampage/2-286, run the SuperPak installation program to install the AST software that makes expanded memory available.

If you have an AST board with a clock/calendar, such as SixPakPlus and SixPakPremium, install the ASTCLOCK software.

If your computer has more than 256 KB conventional memory, extended memory, or emulated extended memory, you may install fASTdisk, SuperSpool, and SuperDrive.

*F. Do you have RAM disks or print spoolers already installed on your boot disk?*

If so, remove them before installing SuperPak.

*G. Do you have AUTOEXEC.BAT and CONFIG.SYS files on your boot disk?*

AUTOEXEC.BAT and CONFIG.SYS are files that set your system's configuration upon booting. If AUTOEXEC.BAT and CONFIG.SYS files do not already exist on your boot disk, the SuperPak installation program will create them for you.

If AUTOEXEC.BAT and CONFIG.SYS already exist on your boot disk, the SuperPak installation program will add or change commands pertaining to SuperPak utilities only. AUTOEXEC.BAT and CONFIG.SYS commands not

pertaining to SuperPak will not be changed. For example, if you have an AUTOEXEC.BAT file set up to log you onto a local area network (LAN), the installation program will add the necessary SuperPak statements and leave your network commands alone.

If you run the installation program more than once and specify the same configuration, the CONFIG.SYS and AUTOEXEC.BAT files will contain duplicate entries. Delete the redundant commands with a text editor or word processor.

### 1.3.1 Configuration Checklist

- A. In what computer are you installing SuperPak?  
 AST Premium computer (or compatible)  
 IBM PC or XT (or compatible)  
 IBM PC AT (or compatible)  
 IBM Personal System/2 (or compatible)
- B. How much conventional memory is in the computer?  
\_\_\_\_\_ KB (640 KB maximum.)
- C. How much extended and expanded memory is in the computer?

Extended memory: \_\_\_\_\_ KB

Expanded memory: \_\_\_\_\_ KB

D. Which boards do you have installed in your computer?

Expanded memory boards?  Yes  No

Name

Amount of Memory

Extended memory boards?  Yes  No

Name

Amount of Memory

AST clock/calendar installed?  Yes  No

Printer port installed?  Yes  No

Check which port is used for the printer:

LPT1  
 LPT2  
 LPT3  
 Other LPT \_\_\_\_\_

COM1  
 COM2  
 COM3  
 Other COM \_\_\_\_\_

E. Which SuperPak utilities do you want to use?

fASTdisk  
 SuperDrive  
 SuperSpool  
 ASTCLOCK

F. Do you have RAM disks and print spoolers already installed on your boot disk?

Yes  No

G. Do you have AUTOEXEC.BAT and CONFIG.SYS files on your boot disk?

Yes  No

### 1.3.2 Memory Requirements

An important consideration in installing SuperPak is the amount of memory in your computer. For example, you may want to set up the following SuperPak utilities:

- One 512-KB fASTdisk.
- One 64-KB SuperSpool.

To do so, you will need a minimum of 576 KB of memory, not counting memory needed for application programs. You can skip over creating a fASTdisk, SuperDrive, or SuperSpool, if you want. Install the AST expanded memory software to use paged memory on an AST expanded memory board.

For more information on allocating memory, see Appendix A.

### 1.3.3 Modifying SuperPak Utilities

In most cases, the basic configurations provided by the installation program will suit your needs. You may need to modify your SuperPak configuration to enhance compatibility or perform special functions, such as the following:

- Configuring SuperDrive to emulate an AT-compatible 1.2 megabyte (MB) diskette drive.
- Routing SuperSpool's printer output to a serial or second parallel port.
- Stopping SuperSpool printer output and reprinting the previous page.

To implement these features, you add parameters to the SuperDrive utility's commands.

For example, to redirect SuperSpool's printing from the first parallel port (LPT1) to the first serial port (COM1) and set the baud rate to 9600, enter:

**SUPERSPL LPT1:=COM1:/RATE=9600**

You can execute this command upon starting by adding it to the AUTOEXEC.BAT file. First, use the installation program to copy the SuperSpool software to your boot disk and add the basic SUPERSPL command to your AUTOEXEC.BAT file. Then, use a text editor or word processor to modify your AUTOEXEC.BAT file to this form of the command.

You may also execute a command at any time by entering it at the DOS prompt. For example, if you have a parallel dot matrix printer and a serial laser printer, you can enter this command to switch printers. If you do not want to type in the entire command each time, you can incorporate it in a batch file. (See your *DOS Manual* for more information on creating and using batch files.)

This section gives you the full set of optional fASTdisk parameters in the standard format and in an alternate VDISK-compatible format. Sample commands illustrate how the fASTdisk parameters work.

## 2.1 Complete fASTdisk Device Statement

The fASTdisk statement is located in the CONFIG.SYS file. To set up a fASTdisk in its default configuration, enter this command in your CONFIG.SYS file:

**DEVICE=FASTDISK.SYS**

The FASTDISK.SYS file can be in any directory as long as you specify the drive and path in the DEVICE statement. If you are booting from a diskette, it must contain both CONFIG.SYS and the fASTdisk driver FASTDISK.SYS.

If the fASTdisk is to run in emulated extended memory, the DEVICE = FASTDISK.SYS statement must appear after the commands for the REMM.SYS and REX.SYS expanded memory drivers.

The complete form for the fASTdisk DEVICE command is as follows:

**DEVICE=FASTDISK.SYS [/SSIZE=xxx] [/DIR=xxx]  
[/M[=xxx]] [/U=xxx] [/EXTM[=xxxx[,yyyy]]]  
[/DEXTM] [/TSIZE=xxxx] [/DL] [/DH] [/DNC]**

Lowercase letters represent variables for the different parameters.

Enter the DEVICE command on one continuous line. Use a slash (/) to separate the options, not a comma. Parameters shown in brackets are optional and can be entered in any order.

These commands are divided into three types of options, which are covered in the following sections:

- *Sector and directory sizes:* See Section 2.1.1 for the options /SSIZE and /DIR.
- *Memory allocation:* See Section 2.1.2 for the options /M, /U, /EXTM, /DEXTM, and /TSIZE.
- *Disabling memory regions:* See Section 2.1.3 for the options /DH, /DL, and /DNC.

### 2.1.1 Sector and Directory Size Options

Sector and directory size parameters enable fASTdisk to emulate attributes of different types of hard disks. Table 2-1 shows the available parameters:

**Table 2-1. Sector and Directory Size Parameters.**

| Parameter | Default | Description   |
|-----------|---------|---|
| /SSIZE=   | 128     | Sets the sector size in bytes. Allowable sizes are 128, 256, and 512.   |
| /DIR=     | 64      | Sets the number of root directories that fASTdisk can contain. Allowable values range from 2 to 512. One directory will be used for the volume label. |

### 2.1.2 Memory Allocation Options

Memory allocation parameters reserve areas of memory for fASTdisk and other applications and enable fASTdisk to operate in extended memory. You may use these options if fASTdisk's default configuration conflicts with the memory requirements of other programs. Table 2-2 lists the parameters.

**Table 2-2. Memory Allocation Parameters.**

| Parameter | Default    | Description   |
|-----------|------------|---|
| /M=       | all memory | Sets the size of the fASTdisk in KB. If just /M is specified, all available linear memory is used for the fASTdisk.   |
| /U=       | 64         | Reserves a minimum amount of memory for applications other than the current fASTdisk.   |
| /EXTM=    | 0,1024     | Enables fASTdisk to use extended memory over 1024 KB. The first value specifies the maximum size for fASTdisk. (The default value 0 indicates no limit.) The second value specifies fASTdisk's starting address in KB, ranging from 1024 KB to the maximum amount of extended memory. |
| /DEXTM    | none       | Specifies that a second fASTdisk be installed in conventional memory. This parameter avoids conflicts with a fASTdisk already installed in extended memory.   |
| /TSIZE=   | 2048       | Sets in bytes the maximum amount of data that can transferred to and from a fASTdisk in extended memory. Acceptable values range from 16 to 32,000 bytes. Enter a value that is a multiple of 16.   |

### 2.1.3 Disabling Memory Regions

The options shown in Table 2-3 apply to older PCs and XTs that determine memory allocation by switch settings. Older computers divide conventional memory into contiguous and non-contiguous ranges. (For more information on memory types, see Appendix A.)

**Table 2-3. Memory Region Options**

| Parameter | Default | Description   |
|-----------|---------|---|
| /DH       | none    | Prevents fASTdisk from using contiguous memory above the limit set by the system board switches. fASTdisk can use memory below the limit set by the switches and non-contiguous memory above address 0C000h (768 KB). |
| /DL       | none    | Prevents fASTdisk from using contiguous memory below the limit set by the system board switches. fASTdisk can use memory above the limit set by the switches and non-contiguous memory above address 0C000h (768 KB). |
| /DNC      | none    | Prevents fASTdisk from using non-contiguous memory beginning at address 0C000h (768 KB). fASTdisk can use memory above the limit set by the switches.   |

## 2.2 VDISK-Compatible fASTdisk Device Command

An alternate form of the DEVICE = FASTDISK.SYS command is similar to that of the IBM VDISK RAM disk. This format is for applications that require compatibility with VDISK.

The parameters in the fASTdisk's VDISK command format are the same as those for the regular format. Their order has been changed to maintain compatibility with VDISK.

The VDISK-compatible format of the DEVICE = FASTDISK.SYS command is as follows:

```
DEVICE=FASTDISK.SYS [aaa[ bbb  
[ ccc]]][/E[:t]][/DEXTM][/U=xxx][/DH][/DL]  
[/DNC]
```

Lowercase letters indicate parameters, which are described in Table 2-4.

**Table 2-4. VDISK-Compatible Command Parameters**

| <b>VDISK Format Parameter</b> | <b>Corresponding Regular Format Parameter</b> | <b>Description</b>   |
|-------------------------------|---|--|
| aaa                           | /M  | Specifies the amount of memory (in KB) to be used by fASTdisk.   |
| bbb                           | /SSIZE  | Specifies the sector size (in bytes).  |
| ccc                           | /DIR  | Specifies the number of directory entries in the root directory.   |
| /E                            | /EXTM   | Enables fASTdisk to operate in extended memory.  |
| :t                            | /TSIZE  | Specifies the transfer rate from a fASTdisk in extended memory.  |
| /DEXTM                        | /DEXTM  | Configures a second fASTdisk to operate in conventional memory to avoid conflict with another fASTdisk in extended memory. |
| /U                            | /U  | Specifies the minimum amount of memory (in KB) to be allocated for applications other than the current fASTdisk.           |
| /DL                           | /DL   | Prevents fASTdisk from using contiguous memory below the system board switch settings.                                     |
| /DH                           | /DH   | Prevents fASTdisk from using contiguous memory above the system board switch settings.                                     |
| /DHC                          | /DHC  | Prevents fASTdisk from using non-contiguous memory.  |

## 2.3 Rules for Using fASTdisk

Follow these rules as you configure fASTdisk:

- If you are installing the REMM.SYS and REX.SYS drivers for expanded memory, put the DEVICE statement for the drivers before the DEVICE = FASTDISK.SYS statement in the CONFIG.SYS file. The SuperPak installation program will write the commands in their proper order.
- The computer installs fASTdisk before installing SuperSpool and SuperDrive. If fASTdisk uses the /EXTM option, so will the other SuperPak utilities (unless they disable it with the /DEXTM option).
- If your computer has extended memory, there is no noncontiguous memory and the [/DNC] option is not used.

## 2.4 Examples of fASTdisk Commands

This section provides examples of the DEVICE = FASTDISK.SYS command. You may use these examples to help you configure fASTdisk for your system.

### 2.4.1 Single fASTdisk Command Examples

The following examples show how to configure one fASTdisk.

#### Example 1

To allocate all extended memory above 1 MB to a fASTdisk, enter this command:

**DEVICE=FASTDISK.SYS /M/EXTM**

This command performs the following:

- The /M parameter indicates that all available memory will be used for the fASTdisk.
- The /EXTM parameter indicates that the fASTdisk is to use extended memory. No offset is indicated, therefore fASTdisk will start at 1024 KB.

### **Example 2**

To create one fASTdisk that uses all available conventional and extended memory, except for 512 KB reserved for applications, and has 128 root directory entries, enter this command:

**DEVICE=FASTDISK.SYS /M/EXTM/DIR=128/U=512**

This command performs the following:

- The /M parameter indicates all available memory will be used for the fASTdisk.
- The /EXTM parameter enables fASTdisk to use extended memory.
- The /DIR = 128 parameter indicates that 128 entries can be used in the fASTdisk root directory.
- The /U = 512 parameter reserves 512 KB for other applications.

### 2.4.2 Dual fASTdisk Command Examples

The following examples show you how to install two fASTdisks.

#### Example 1

To create one 200-KB fASTdisk in extended memory and a second 100-KB fASTdisk, enter these commands in this order in the CONFIG.SYS file:

**DEVICE=FASTDISK.SYS 200 /E**

**DEVICE=FASTDISK.SYS /M=100**

The first command, entered in VDISK format, does the following:

- The number 200 allocates 200 KB for the fASTdisk.
- The /E parameter instructs fASTdisk to operate in extended memory.
- Since no other parameters have been specified, fASTdisk will use defaults for those values.

The second command, entered in the regular fASTdisk format, does the following:

- The parameter /M = 100 allocates 100 KB for the fASTdisk.
- Since the first fASTdisk was created in extended memory, the second fASTdisk will be also. (To configure the second fASTdisk in conventional memory, use the /DEXTM parameter.)
- Since no other parameters were specified, fASTdisk will use defaults for those values.

### Example 2

To create one 50-KB fASTdisk in conventional memory with 128 root directory entries and a second fASTdisk in extended memory, enter the following commands in this order:

**DEVICE=FASTDISK.SYS 50/DIR=128**

**DEVICE=FASTDISK.SYS /EXTM**

The first command, written in VDISK format, does the following:

- The number 50 allocates 50 KB for the first fASTdisk.
- The /DIR = 128 parameter indicates that fASTdisk will have a maximum of 128 root directory entries.
- Since the /E parameter was not specified, memory for the first fASTdisk will come from conventional memory.
- Since no other parameters were specified, fASTdisk will use defaults for those values.

The second command, written in regular fASTdisk format, does the following:

- The /EXTM parameter indicates that the second fASTdisk will operate in extended memory.
- Since no other parameters were specified, fASTdisk will use defaults for those values.

## 2.5 Application Notes

This section provides suggestions on using fASTdisk to the best advantage.

### 2.5.1 fASTdisk Compatibility

fASTdisk functions as an already formatted hard disk. You can use DOS commands and applications with it.

Any program you can copy to a diskette or hard disk can also be copied to a fASTdisk. If your program is copy-protected, you will not be able to copy it to a fASTdisk.

If you want to run an application on a fASTdisk from the AUTOEXEC.BAT file, you must enter commands to copy the program to the fASTdisk before executing it. For example, to copy and run Microsoft® Word, enter these commands in your AUTOEXEC.BAT file:

```
COPY A:.* D:  
D:  
WORD
```

These commands copy the Word program files from floppy drive A to fASTdisk D. The AUTOEXEC.BAT file then changes to drive D and executes Word.

Some programs require an application to be launched from a specific drive, even when the default drive has been changed. If this is the case for your program, you may configure your fASTdisk to be the same designation as that which the program expects.

### **2.5.2 Using fASTdisk with Modular Software**

You can enhance the speed and performance of disk-intensive or modular software by installing it on a fASTdisk.

For example, if you have a word processor with a spelling checker, you can copy the dictionary files to the fASTdisk. This will speed up the time the spelling checker requires to search for words. Likewise, you can copy to the fASTdisk applications broken into different modules (such as accounting software, word processors, and other large programs). You will not have to keep your program disk in the drive or wait for software modules to load.

Keep your data on a diskette or hard disk so you do not lose any information if the computer is turned off.

### **2.5.3 Protecting Important Data Files**

Since fASTdisk is a part of the computer's memory, any data stored on the fASTdisk will be lost if the computer is turned off or rebooted. Therefore, do not store files you cannot afford to lose on your fASTdisk. The best way to use fASTdisk is to run your application programs on it and keep your data files on your diskettes or hard disk.

If you decide to store data files on a fASTdisk, you may want to create a batch file to back up your data files to a diskette or hard disk after you exit from the application.

The following sample AUTOEXEC.BAT file copies the program and data from the diskette in drive A to the fASTdisk drive D and runs the application. After you quit the program, the batch file continues by copying the contents of the RAM disk back to drive A.

```
COPY A:.* D:  
D:  
program  
COPY D:.* A:
```

Replace *program* with the file name of the application to run from drive D.

This AUTOEXEC.BAT does the following:

- The COPY A:.\* D: command copies all the files on drive A, presumably the program diskette, to the fASTdisk drive D.
- The D: command makes fASTdisk the default drive.
- The third line executes the program. Replace the variable *program* with the name of your application file.
- After you exit from the application, AUTOEXEC.BAT continues. The COPY D:.\* A: command copies the fASTdisk's contents to the diskette in drive A.

For more information on any of these commands, see your computer's DOS manual.

## NOTES

This section provides the options that you can use to modify or control the SuperSpool printer spooler. Sample commands and application notes will demonstrate how the options work.

## 3.1 Using the SuperSpool Command

To set up a SuperSpool each time you boot the computer, use the SuperPak installation program to add the SuperSpool command to your AUTOEXEC.BAT file by using the SuperPak installation program or by typing commands at the DOS prompt.

If you are using SuperSpool with parallel port LPT1 or any serial port, enter the following command before running SuperSpool:

### MODE LPT1:

This command initializes LPT1 and enables SuperSpool to print from DOS and other applications using LPT1. Do not use the MODE LPT1: command if you are using another parallel port.

To set up SuperSpool in its default configuration for a parallel port, enter this command:

### SUPERSPL LPTp:

Substitute *p* for the parallel port number.

To set up SuperSpool in its default configuration for a serial port, enter this command:

### SUPERSPL LPT1:=COMs:

Substitute *s* for the serial port number.

There are different versions of the SUPERSPL command for configuring SuperSpool with parallel and serial ports. To use SuperSpool with a parallel printer, see Section 3.2. To use SuperSpool with a serial printer, see Section 3.3.

### **3.1.1 Printing with SuperSpool**

To use SuperSpool from DOS, use the COPY command to direct the file to the printer port used for SuperSpool. Do not use the DOS PRINT command because it uses the DOS print buffer.

For example, to print the file SAMPLE.TXT to a SuperSpool set up for LPT2, enter the following:

**COPY SAMPLE.TXT LPT2: <Enter>**

The text for SAMPLE.TXT will print on the printer attached to LPT2.

With applications, use your normal printing procedures. Configure SuperSpool for the port to which you normally send your printing. When you print, the output will go to SuperSpool before going to the printer. If your application comes with a print spooler, be sure to disable it before using SuperSpool.

### **3.1.2 SuperSpool Help**

For a complete list of SuperSpool commands, type the following at the DOS prompt:

**SUPERSPL /? <Enter>**

The SuperSpool commands will appear on the screen with explanations.

## 3.2 Using SuperSpool with Parallel Printers

The complete form of the SuperSpool command for parallel printers is as follows:

```
SUPERSPL LPTp: [/?] [/U=xxx] [/M[=xxx]]  
[/EXTM[=xxxx[, yyyy]]] [/DEXTM] [TSIZE=xxxx]  
[/DH] [/DL] [/DNC] [/DBI] [/DMMGMT] [/LPP=xx]  
[/FF] [/STRING=xxx[, xxx, ...]] [/S] [/C] [/P]  
[/B] [/R] [/RP] [/PINT[=X]]
```

Lowercase letters represent variables for the different parameters.

Enter the command on one continuous line. Use a slash to separate the options, not a comma. Enter the optional parameters in any order.

These commands are divided into three types of options, which are covered in the following sections:

- *Printer port controls:* See Section 3.2.1 for the options LPTp: and /PINT.
- *Memory allocation:* See Section 3.2.2 for the options /U, /M, /EXTM, /DEXTM, /TSIZE, /DH, /DL, /DNC, /DBI, and /DMMGMT.
- *Printer controls:* See Section 3.2.3 for the options /LPP, /FF, /STRING, /S, /C, /P, /B, /R, and /RP.

### 3.2.1 Printer Port Controls

By default, SuperSpool sends the output to LPT1. You may use another printer port with SuperSpool by typing its DOS name after the SUPERSPL command. To direct SuperSpool output to LPT2, enter the following:

**SUPERSPL LPT2:**

## NOTE

The PS/2 designates parallel ports as PARALLEL\_1, PARALLEL\_2, and so forth. Under DOS, these ports are called LPT1 and LPT2. Be sure to use the DOS names for parallel ports in the SUPERSPL command.

By default, SuperSpool uses the interrupt request (IRQ) number for the port you specify. If you configured your port for another IRQ number, use the /PINT option to specify it. You may use any value from 0 to 7, but IRQ values other than 7 are used with specially designed printer hardware.

To specify IRQ7 and LPT1, enter the following SuperSpool command:

**SUPERSPL LPT1: /PINT=7**

See your printer's user manual for more information on IRQ assignments.

### 3.2.2 Memory Allocation Parameters

Memory allocation parameters reserve areas of memory for SuperSpool and other applications and enable SuperSpool to operate in extended memory. You may use these options if SuperSpool's default configuration conflicts with the memory requirements of other programs. Table 3-1 lists the parameters.

**Table 3-1. Memory Allocation Parameters.**

| Parameter | Default    | Description   |
|-----------|------------|---|
| /M=       | all memory | Sets the size of the SuperSpool in KB. Entering only /M uses all available linear memory for the SuperSpool.  |
| /U=       | 64         | Reserves a minimum amount of memory for applications other than the current SuperSpool.   |
| /EXTM=    | 0,1024     | Enables SuperSpool to use extended memory over 1024 KB. The first value specifies the maximum size for SuperSpool. (The default value 0 indicates no limit.) The second value specifies SuperSpool's starting address in KB, ranging from 1024 KB to the maximum amount of extended memory. |
| /DEXTM    | none       | Disables SuperSpool's use of extended memory after it has been installed with the /EXTM command.  |
| /TSIZE=   | 2048       | Sets in bytes the maximum amount of data that can be transferred to and from a SuperSpool in extended memory. Acceptable values range from 16 to 32,000 bytes. Enter a value that is a multiple of 16.  |
| /DMMGMT   | none       | Prevents SuperSpool from using additional unallocated memory. Disables SuperSpool's calls to DOS memory management.   |
| /DBI      | none       | Disables the block transfer interface to avoid conflicts with other applications. Use this parameter if your application uses interrupt vector INT 058h.  |

Table 3-2 lists options that apply to older PCs and XTs which determine memory allocation by switch settings. Older computers divide conventional memory into contiguous and non-contiguous ranges. (For more information on memory types, see Appendix A.)

**Table 3-2. Memory Region Controls.**

| Parameter | Default | Description  |
|-----------|---------|--|
| /DH       | none    | Prevents SuperSpool from using contiguous memory above the limit set by the system board switches. SuperSpool can use memory below the limit set by the switches and non-contiguous memory above address 0C0000h (768 KB). |
| /DL       | none    | Prevents SuperSpool from using contiguous memory below the limit set by the system board switches. SuperSpool can use memory above the limit set by the switches and non-contiguous memory above address 0C0000h (768 KB). |
| /DNC      | none    | Prevents SuperSpool from using non-contiguous memory beginning at address 0C0000h (768 KB). SuperSpool can use memory above the limit set by the switches.   |

### 3.2.3 Printer Control Options

The options in this section enable you to control printing, set print format, and send text strings to the printer.

You may use these commands to control the printer from DOS. You do not have to enter the entire SUPERSPL command. For example, type the following to stop printing.

**SUPERSPL /S<Enter>**

To continue printing, type the following command.

**SUPERSPL /C<Enter>**

Table 3-3 lists options for printer formats and controls.

**Table 3-3. Printer Format and Control Options.**

| Parameter | Default | Description   |
|-----------|---------|---|
| /LPP =    | 66      | Sets the number of lines per page. Default value prints an 11 inch page with 6 lines per inch.  |
| /FF       | none    | Sends a form-feed character to the printer.   |
| /STRING = | none    | Sends a series of decimal ASCII codes to the printer. List each code in order (up to three digits) and separate them with commas. You may include control and character codes. The printer will interpret and print them. |
| /S        | none    | Stops printing. No data will be lost. To restart printing, use the SUPERSPL/C command.  |
| /C        | none    | Continues printing from where it was stopped by the SUPERSPL /S command.  |
| /P        | none    | Purges all data from the SuperSpool. Any data stored there will be lost.  |

SuperSpool has three options for controlling reprinting pages: /B, /R, and /RP. They are used in combination after the printer has been stopped with the /S option.

The /B option sets a buffer for storing pages. Your SuperSpool should have at least 16 KB to use this option. The /B option enables the /R and /RP options. /R restarts printing at the beginning of the current page. /RP restarts printing at the beginning of the previous page.

Do not combine the /B option with the /R or /RP options in the same line. The /B option is to be used when first initializing your spool buffer. The /R and /RP options are for use only after printing has already begun.

Use the /R and /RP options in this sequence:

**STEP 1**

*Set up a buffer:* Before printing, use the /B parameter to set up a buffer for reprinting pages, as shown in this command:

**SUPERSPL /B**

**STEP 2**

*Stop printer output:* From DOS, enter this command to stop printer output:

**SUPERSPL /S**

**STEP 3**

*Set the paper at the top of the form:* Use the printer's top-of-form control to place the print head at the top of the next page.

**STEP 4**

*Continue printing:* Enter the following command to restart printing at the current or previous page, respectively.

**SUPERSPL /R or SUPERSPL /RP**

### 3.3 Using SuperSpool with Serial Printers

The complete form of the SuperSpool command for serial ports is as follows:

```
SUPERSPL LPTp:=COMs:[/] [/RATE=baud[,parity  
[,databits[,stopbits]]]] [/U=xxx] [/M=xxx]  
[/EXTM=[xxxx[,yyyy]]] [/DEXTM] [/ON=option]  
[/OFF=option] [/TSIZE=xxxx] [/DH] [/DL] [/DNC]  
[/DBI] [/DMMGMT] [/LPP=xx] [/FF]  
[/STRING=xxx[,xxx,...]] [/S] [/C] [/P] [/B]  
[/R] [/RP] [/SINT[=x]]
```

Lowercase characters represent variables for the different parameters.

Enter the command on one continuous line. Use a slash to separate the options, not a comma. Parameters shown in the brackets are optional and can be entered in any order.

Many serial port options are the same as for the parallel port. Refer to the following sections for these options:

- *Memory allocation options:* See Section 3.2.2 for the options /U, /M, /EXTM, /DEXTM, /TSIZE, /DH, /DL, /DNC, /DBI, and /DMMGMT.
- *Printer controls:* See Section 3.2.3 for the options /LPP, /FF, /STRING, /S, /C, /P, /B, /R, and /RP.

The rest of the options configure the printer port and are unique to serial printers. These are covered in Section 3.3.1.

### 3.3.1 Serial Port Controls

To work with serial printers, SuperSpool requires you to redirect printing from LPT1 to the serial port of your choice. This enables SuperSpool to use <Print Screen> and other print commands specific to LPT1.

To use SuperPak with a serial port, enter this command:

**SUPERSPL LPT1:=COMs:**

Substitute s for the serial port number.

This command does the following:

- It redirects printing from the parallel port to the serial port you specify.
- LPTp responds as the next available LPT port. (LPT1 becomes LPT2, LPT2 becomes LPT3, and so forth.).

For example, enter the following command sets up SuperSpool to print to COM1:

**SUPERSPL LPT1:=COM1:**

This command redirects the output from LPT1 to COM1 and changes LPT1 to LPT2.

You must redirect printing from LPT1 to a serial port to use a serial printer with SuperSpool. The following format is not valid:

**SUPERSPL COM1:**

By default, SuperSpool uses the IRQ for the port you specify. If you configured your port for another IRQ number, use the /SINT option to specify it. You may use any value from 0 to 7, but IRQ values other than 3 and 4 are used by specially designed printer hardware.

To specify IRQ4 and COM1, enter the following SuperSpool command:

**SUPERSPL LPT1:=COM1: /SINT=4**

See your printer's user manual for more information on IRQ assignments.

In many cases, you also need to set communications parameters for the serial port, including baud rate, parity, and stop bits. Table 3-4 lists the communications parameters.

**Table 3-4. SuperSpool Communications Parameters.**

| <b>Parameter</b> | <b>Default</b> | <b>Description</b>   |
|------------------|----------------|--|
| /RATE            | none           | Sets the serial ports baud rate, parity, databits, and stopbits. All four values must be indicated in this parameter.  |
| baud             | none           | Sets the serial device's baud rate. Valid rates are 110, 150, 300, 600, 1200, 2400, 4800, and 9600. If the rate is not specified, SuperSpool will use the baud rate previously configured for that device (as with the MODE command).  |
| parity           | E (even)       | Set the parity. Valid values are N (none), O (odd), and E (even). Do not spell out the values.   |
| databits         | 7              | Sets the number of bits in the byte used to represent characters. Valid values are 7 and 8.  |
| stopbits         | 1              | Sets the number of bits in the byte used to indicate the end of the character. Valid values are 0 and 1.   |
| /ON              | CTS.DSR        | Enables serial port protocol options. Valid options are XON (for XON/XOFF), DCD, DSR, and CTS.<br><br>Most printers require CTS and DSR to be on before it can receive output. For information on the serial port protocols required for your printer, see your printer's user manual. |
| /OFF             | DCD,XON        | Disables serial port protocol options. Valid options are XON (for XON/XOFF), DCD, DSR, and CTS.  |

## 3.4 SuperSpool Examples

The following examples show how options are used with parallel and serial printers. Specific examples are covered in the following sections:

- *For parallel printer configuration examples:* See Section 3.4.1.
- *For serial printer configuration examples:* See Section 3.4.2.
- *For memory allocation examples:* See Section 3.4.3.
- *For printer control examples:* See Section 3.4.4.

### 3.4.1 Parallel Printer Configuration Examples

These examples show you how to use SuperSpool with parallel printers.

#### Example 1

To configure SuperSpool for LPT2 each time you start the computer, add the following lines in your AUTOEXEC.BAT file:

```
MODE LPT1  
SUPERSPL LPT2:
```

This command performs the following:

- MODE LPT1 initializes the printer port. You must enter this command or add it to your AUTOEXEC.BAT file before using SuperSpool.
- SUPERSPL LPT2: sets up SuperSpool for parallel port LPT2.

Since these commands are in your AUTOEXEC.BAT file, they will be executed every time you boot your computer.

### Example 2

To use SuperSpool with a printer configured for LPT1 and IRQ7, enter this command:

**SUPERSPL LPT1: /PINT=7**

This command does the following:

- SUPERSPL LPT1: sets up SuperSpool for LPT1.
- The /PINT = 7 parameter indicates the port is configured as IRQ7.

### 3.4.2 Serial Printer Configuration Examples

These examples show you how to configure SuperSpool for the serial port.

#### Example 1

To set up SuperSpool for serial port COM1 each time you boot your computer and use a 9600 baud rate, even parity, 8 databits, and 1 stopbit, enter the following commands in your AUTOEXEC.BAT file:

**MODE LPT1:  
SUPERSPL LPT1:=COM1: /RATE=9600,E,8,1**

These commands do the following:

- MODE LPT1: initializes the printer port. Enter this command before using SuperSpool with LPT1 or a serial port.
- SUPERSPL LPT1:=COM1: directs printer output from LPT1 to COM1. LPT1 will be renamed LPT2.
- The /RATE parameter sets the serial port configuration. The values 9600, E, 8, and 1 set the baud rate, parity, databits, and stopbits respectively.

Since these commands are included in your AUTOEXEC.BAT file, they will be executed every time you boot your computer.

### Example 2

To use SuperSpool with a serial port configured for COM2, IRQ3, 9600 baud, no parity, 7 databits, 1 stopbit, and CTS and DSR off, enter the following:

```
SUPERSPL LPT1:=COM2: /SINT=3  
/RATE=9600,N,7,1/OFF=CTS/OFF=DSR
```

This command does the following:

- SUPERSPL LPT1:=COM2: redirects the printer output from LPT1 to COM2. LPT1 is renamed LPT2.
- The /SINT = 3 parameter specifies that COM2 is configured for IRQ3.
- The /RATE parameter sets the serial port configuration. The values 9600, N, 7, and 1 set the baud rate, parity, databits, and stopbits respectively.

- The /OFF = CTS parameter disables the CTS signal.
- The /OFF = DSR parameter disables the DSR signal.

### 3.4.3 Memory Allocation Examples

These examples show you how to configure SuperSpool for different memory allocations.

#### Example 1

To allocate 128 KB of extended memory for SuperSpool, enter the following:

**SUPERSPL LPT1: /M=128/EXTM**

This command does the following:

- SUPERSPL LPT1: sets up SuperSpool for a parallel port, in this case, LPT1.
- The /M = 128 parameter allocates 128 KB for the SuperSpool.
- The /EXTM parameter enables SuperSpool to use extended memory. No offset is indicated, therefore, SuperSpool will start at 1024 KB.

### Example 2

To create a SuperSpool for COM1 that uses all available conventional and extended memory except for 512 KB reserved for applications, enter this command:

```
SUPERSPL LPT1:=COM1: /M/EXTM/U=512
```

This command does the following:

- SUPERSPL LPT1:=COM1: directs printer output from LPT1 to COM1. LPT1 is renamed LPT2.
- The /M parameter indicates that all available memory will be used for SuperSpool.
- The /EXTM parameter enables SuperSpool to use extended memory.
- The /U=512 parameter reserves 512 KB for other applications.

### 3.4.4 Printer Control Examples

These examples show how to use the SuperSpool printer controls.

#### Example 1

To set the page length to 51 lines (8.5 inches at 6 lines per inch), enter the following:

**SUPERSPL /LPP=51**

This command does the following:

- SUPERSPL invokes the SuperSpool program. You do not have to specify the port designation unless you are changing it.
- The */LPP = 51* parameter sets the page length to 51 lines.

#### Example 2

To send codes to print enhanced text on Epson® printers (27 and 69 decimal), enter the following:

**SUPERSPL /STRING=27,69**

This command does the following:

- SUPERSPL invokes the SuperSpool program. You do not have to specify the port designation unless you are changing it.
- The */STRING* parameter sends decimal ASCII codes 27 and 69, which are used to invoke the Epson printer's enhanced mode.

### Example 3

To stop printing, force a form feed, and resume printing at the beginning of the previous page, enter the following commands:

```
SUPERSPL /B  
SUPERSPL /S  
SUPERSPL /FF  
SUPERSPL /RP
```

These commands do the following:

- SUPERSPL /B sets up a buffer for storing pages to reprint.
- SUPERSPL /S stops the printing.
- SUPERSPL /FF sends the form feed character to the printer.
- SUPERSPL /RP resumes printing at the start of the previous page.

## 3.5 SuperSpool Application Notes

The following sections discuss how to best handle particular tasks when using SuperSpool, such as checking on the SuperSpool status and changing the printer configuration.

### 3.5.1 Determining Printing Status

To check the status of your SuperSpool, type the following at the DOS prompt:

```
SUPERSPL <Enter>
```

You will see the port attached to SuperSpool and the amount of data in the buffer, as shown in the following example. (The printer port designation and amount of memory are examples and may be different from your actual configuration.)

LPT1: is ready

24653 bytes buffered for output

The status will also appear whenever you issue a SUPERSPL command at the DOS prompt. If you stop printing with the SUPERSPL /S command, you will see this message:

LPT1: is stopped

24653 bytes buffered for output

### 3.5.2 Changing Printer Configuration

You can change the SuperSpool-directed printer port configuration when the spool buffer is empty. To attach SuperSpool to another printer port, use the SUPERSPL /P command to purge the buffer before entering the command to select the port.

You can only modify the memory and buffer configuration options (/M, /M = xxx, or /U = xxx) after rebooting the computer. These commands can be added to the AUTOEXEC.BAT file to configure memory each time you start the computer.

### 3.5.3 SuperSpool Compatibility

SuperSpool works with applications that send files directly to parallel and serial ports. You may use SuperSpool to print files directly from DOS with the COPY command and <Print Screen>. SuperSpool is also compatible with most versions of BASIC.

Some applications, especially word processors and desktop publishing software, have custom printer drivers that modify data during printing. While SuperSpool may enhance the performance of these programs, their formatting routines will slow down printing.

Custom serial printer drivers may not be compatible with SuperSpool. Refer to your application's user manual if you have questions about using printer drivers with print spoolers.

### **3.5.4 SuperSpool Utility Batch Files**

You can invoke the SuperSpool program from an AUTOEXEC.BAT or other batch files. Refer to your computer's DOS Manual for more detailed information on batch files.

Before you use the SUPERSPL command with LPT1 and any serial port, enter MODE LPT1: to initialize the printer port. Add this statement to your AUTOEXEC.BAT file in a line before the command for SuperSpool. You do not have to type MODE LPT1: again until you reboot. Omit the MODE LPT1 command if you are using SuperSpool with another parallel port.

You may want to add one or more batch files to change the printer configuration or display the status. This eliminates the lengthy commands you would have to use otherwise.

The commands in the following example create a batch file, called NEC.BAT, that spools print data to a typical NEC™ serial printer at 1200 baud, even parity, 7 data bits, 1 stop bit. It monitors the CTS signal, ignores the DCD and DSR signals, sets up a 16KB print spool buffer, and selects page reprint functions. It also allocates a minimum of 64 KB for an applications program.

```
MODE LPT1:<Enter>
SUPERSPL LPT1:=COM1:/RATE=1200,E,7,1
/ON=CTS/OFF=DCD,DSR/M=16 /B<Enter>
```

Once the NEC.BAT file is on your DOS diskette, all you have to do to initialize SuperSpool for this NEC printer is type the following:

**NEC <Enter>**

### **3.5.5 Using SuperSpool with Other Buffers**

You may use SuperSpool when there are no other print spoolers on your system. If you have another print spooler installed in your computer, disable it before using SuperSpool.

Some printers, especially laser printers, come with their own built-in buffers. Printing will slow down if both SuperSpool and the printer's buffer are active. To correct the problem, disable either SuperSpool or the printer's buffer.

Microsoft® Windows and other operating systems come with their own print spoolers. Disable SuperSpool before using an application's spooler.

## NOTES

You can configure SuperDrive to emulate a variety of drives, including single-sided, double-sided, and high-density. Like the other SuperPak utilities, SuperDrive can be set up to run in specific areas of memory.

This section provides the optional parameters you can use to modify SuperDrive. Sample commands and application notes will show you how to use the options. A list of error messages help you look for configuration problems.

## NOTE

SuperDrive is not compatible with the PS/2 and not recommended for AT-compatible computers with only one diskette drive.

### 4.1 Entering the SuperDrive Command

To set up a SuperDrive each time you start the computer, add the SuperDrive command to your AUTOEXEC.BAT file by using the SuperPak installation program or by typing the commands. Once you set up a SuperDrive, do not modify it until you reboot your computer.

#### 4.1.1 Creating a SuperDrive with Default Settings

To create a SuperDrive in its default configuration, enter the following:

**SUPERDRV drive:**

Substitute *drive* for any valid DOS letter designating the drive.

To set up a SuperDrive in its default configuration as drive D, enter the following:

**SUPERDRV D:**

If you want to install SuperDrive on an AT-compatible computer, you must select a drive designation for an existing diskette drive. If you have two diskette drives (A and B), you may name SuperDrive device B.

However, if you assign SuperDrive the same letter as a diskette drive, you cannot use the physical drive. If you have only one drive in your Premium/286 or PC AT (drive A), do not use SuperDrive. Use fASTdisk instead.

#### **4.1.2 Inserting a SuperDrive**

With the PC, XT, and compatible computers, you may assign SuperDrive the same drive designation of a physical drive without disabling it. The /I parameter inserts SuperDrive at the drive designation you select and moves the physical drives up one letter.

For example, to install SuperDrive as drive B in a two-diskette drive system, enter the following:

**SUPERDRV B:/I**

This command does the following:

- The first physical drive remains drive A.
- SuperDrive becomes drive B.
- The second physical drive is reassigned as drive C.

### 4.1.3 SuperDrive Help

For a complete list of SuperDrive options, type the following at the DOS prompt:

**SUPERDRV /? <Enter>**

The SuperDrive commands will appear on the screen with explanations. Do not use this command in your AUTOEXEC.BAT file.

## 4.2 SuperDrive Options

The complete form of the SuperDrive command is as follows:

**SUPERDRV drive: [/I] [/U=xxx] [/M=xxx]  
[/EXTM[=xxxx[,yyyy]]] [/DEXTM] [/i] [/4] [/8]  
[/15] [/TSIZE=xxxx] [/DH] [/DL] [/DNC]  
[/DMMGMT]**

Lowercase letters represent variables for the different parameters.

Enter the command on one continuous line. Use a slash to separate the options, not a comma. Optional parameters can be entered in any order.

These commands are divided into two types of options, which are covered in the following sections:

- *Drive configuration options:* See Section 4.2.1 for the options drive: /1, /4, /8, and /15.
- *Memory configuration options:* See Section 4.2.2 for the options /U, /M, /EXTM, /DEXTM, /DH, /DL, /DNC, and /DMMGMT.

#### 4.2.1 Drive Configuration Options

The options in this section determine the type of drive SuperDrive will emulate. (See Table 4-1.) SuperDrive's capacity depends on the type of drive emulation you select. If you configure SuperDrive as single-sided, it will be 180 KB. To specify a different memory size, use the /M option described in Section 4.3.

**Table 4-1. SuperDrive Configuration Options.**

| Parameter | Default Size | Description   |
|-----------|--------------|---|
| /1        | 180 KB       | Emulates a single-sided diskette (for DOS 2.0 and 2.1).   |
| /4        | 360 KB       | Emulates a double-sided diskette (for DOS 3.0 and above).   |
| /8        | none         | Specifies 8 sectors per track. If this option is omitted, SuperDrive will emulate 9 sectors per track.  |
| /15       | 1.2 MB       | Specifies 15 sectors per track and emulates a high-density 1.2 MB drive. (This option requires an AT-compatible computer and DOS 3.0 or above.) |

#### 4.2.2 Memory Configuration Options

Memory allocation parameters reserve areas of memory for SuperDrive and other applications and enable SuperDrive to operate in extended memory. You may use these options if SuperDrive's default configuration conflicts with the memory requirements of other programs. Table 4-2 lists the parameters.

**Table 4-2. Memory Allocation Parameters.**

| Parameter | Default | Description   |
|-----------|---------|---|
| /M=       | 360     | Sets the size of the SuperDrive in KB.  |
| /U=       | 64      | Reserves a minimum amount of memory for applications other than the current SuperDrive.   |
| /EXTM=    | 0,1024  | Enables SuperDrive to use extended memory over 1024 KB. The first value specifies the maximum size for SuperDrive. (The default value 0 indicates no limit.) The second value specifies SuperDrive's starting address in KB, ranging from 1024 KB to the maximum amount of extended memory. |
| /DEXTM    | none    | Disables SuperDrive's use of extended memory after it has been installed with the /EXTM command.  |
| /TSIZE=   | 2048    | Sets in bytes the maximum amount of data that can transferred to and from a SuperDrive in extended memory. Acceptable values range from 16 to 32.000 bytes. Enter a value that is a multiple of 16.   |
| /DMMGMT   | none    | Prevents SuperDrive from using additional unallocated memory. Disables SuperDrive's calls to DOS memory management.   |
| /DBI      | none    | Disables the block transfer interface to avoid conflicts with other applications. Use this parameter if your application uses interrupt vector INT 058h.  |

Table 4-3 lists options that apply to older PCs and XTs which determine memory allocation by switch settings. Older computers divide conventional memory into contiguous and non-contiguous ranges. (For more information on memory types, see Appendix A.)

**Table 4-3. Memory Region Controls.**

| Parameter | Default | Description  |
|-----------|---------|--|
| /DH       | none    | Prevents SuperDrive from using contiguous memory above the limit set by the system board switches. SuperDrive can use memory below the limit set by the switches and non-contiguous memory above address 0C0000h (768 KB). |
| /DL       | none    | Prevents SuperDrive from using contiguous memory below the limit set by the system board switches. SuperDrive can use memory above the limit set by the switches and non-contiguous memory above address 0C0000h (768 KB). |
| /DNC      | none    | Prevents SuperDrive from using non-contiguous memory beginning at address 0C0000h (768 KB). SuperDrive can use memory above the limit set by the switches.   |

## 4.3 SuperDrive Examples

This section provides examples of using SuperDrive in specific configurations. Use these examples to help you configure SuperDrive for your own applications.

### 4.3.1 Drive Configuration Examples

These examples show you how to configure SuperDrive for different applications.

#### Example 1

A PC XT has a diskette drive and a hard disk. To create an 8-track-per-sector double-sided SuperDrive as drive B, enter the following command:

**SUPERDRV B: /4/8**

This command does the following:

- The B: parameter specifies that SuperDrive is drive B. Since the /l parameter is not used, the designations of the other drives are not affected.
- The /4 parameter specifies a double-sided drive. By default, SuperDrive will have a 360 KB capacity.
- The /8 parameter specifies an 8-track-per-sector diskette.

### Example 2

A PC-compatible computer has two diskette drives. To create a single-sided SuperDrive and insert it as drive B, enter the following:

**SUPERDRV B: /I/1**

This command does the following:

- The B: parameter specifies that SuperDrive is drive B.
- The /I parameter indicates SuperDrive is to be inserted in the sequence after the first physical drive (Drive A), and the second physical drive will move down a letter to become drive C.
- The /1 parameter specifies that SuperDrive is a single-sided 180-KB drive. Be sure to use DOS 2.0 or 2.1 with this configuration.

### Example 3

A Premium/286 has two diskette drives and one hard disk. To create a 1.2 MB SuperDrive as drive B, enter the following:

**SUPERDRV B: /15**

This command does the following:

- The B: parameter specifies SuperDrive as drive B. SuperDrive will replace and disable your computer's physical drive B.
- The /15 parameter configures SuperDrive as a high-density diskette.

### 4.3.2 SuperDrive Memory Configuration Examples

These examples show you how to configure SuperDrive for different memory allocations.

#### Example 1

A PC has 512 KB of conventional memory and a single diskette drive. To set up a 128 KB double-sided SuperDrive as drive B and reserve a minimum of 256 KB for other applications, enter the following:

**SUPERDRV B: /4/M=128/U=256**

This command does the following:

- The B: parameter specifies SuperDrive as drive B.
- The /4 parameter instructs SuperDrive to emulate a double-sided diskette.
- The /M = 128 parameter sets the SuperDrive capacity to 128 KB. The computer will remind you that SuperDrive is less than the normal double-sided configuration when you boot. (See Section 4.5.)
- The /U = 256 parameter reserves a minimum of 256 KB for applications other than SuperDrive.

### Example 2

An XT-compatible computer has 640 KB of conventional memory, 512 KB of emulated extended memory on a paged memory board, and two physical diskette drives. To create a double-sided SuperDrive as drive D in extended memory only, enter the following:

**SUPERDRV D: /4/EXTM**

This command does the following:

- The D: parameter specifies SuperDrive as drive D.
- The /4 parameter specifies that SuperDrive will be double-sided. Since no memory amount is specified, SuperDrive will use the default capacity of 360 KB.
- The /EXTM parameter enables SuperDrive to use extended memory. No offset is specified, so SuperDrive will start at 1024 KB.

### Example 3

A Premium/286 has 640 KB of conventional memory, 256 KB of extended memory, and two diskette drives. To create a high-density SuperDrive that uses only extended memory, enter the following:

**SUPERDRV B: /15/EXTM/M=256**

This command does the following:

- The B: parameter specifies SuperDrive as drive B. On AT-compatible computers, SuperDrive must replace an existing drive. This command replaces and disables the second physical drive.

- The /15 parameter instructs SuperDrive to emulate a high-density diskette.
- The /EXTM parameter enables SuperDrive to run in extended memory.
- The /M = 256 parameter limits the SuperDrive capacity to 256 KB. The computer will remind you that SuperDrive is less than the normal high-density configuration when you boot. (See Section 4.5.)

## 4.4 SuperDrive Application Notes

This section provides suggestions on making the best use of SuperDrive with different applications.

Since any data stored on a SuperDrive is actually stored in RAM, it will be lost turn off or reboot the computer. Be sure to copy SuperDrive files regularly to a diskette or the hard disk.

### 4.4.1 Creating SuperDrive A from an AUTOEXEC.BAT File

DOS will not let you create a SuperDrive as drive A from an AUTOEXEC.BAT file. (Appendix B describes AUTOEXEC.BAT files.) You can work around this limitation by creating a batch file called from AUTOEXEC.BAT that creates the drive A SuperDrive. Your computer needs two physical drives to perform this operation.

Use a text editor or word processor to create an AUTOEXEC.BAT file on your boot diskette or hard disk root directory. It will contain the following commands:

```
ASTCLOCK  
MODE LPT1:  
B:  
MAKE-A
```

MAKE-A is a batch file that contains the commands for creating SuperDrive. Create it with a text editor or word processor, and copy it to your boot diskette and the program diskette you will put in drive B. A sample MAKE-A.BAT file contains the following commands:

```
SUPERDRV A:/I  
SUPERSPL LPT1:  
COPY B:.*.* A:  
A:  
program
```

Substitute *program* for the filename of the software to run from drive A.

When you are ready to start the computer, put in drive A the diskette contains all of the programs that you want to execute from the SuperDrive. Put in drive B the diskette with the SuperDrive and SuperSpool programs. Both the diskettes in drive A and drive B contain the MAKE-A.BAT batch file.

#### 4.4.2 Single-Drive Systems

This section provides several suggestions for using SuperDrive with one physical diskette drive. Do not use SuperDrive with AT-compatible computers with one physical drive.

You must be aware of two things when copying files from one diskette to another:

- If you want to use the COPY command to move files from one diskette to another, copy the files to SuperDrive first and then transfer them to the other diskette.

- The DISKCOPY command can transfer the entire contents of a diskette to another diskette or SuperDrive. To copy to another diskette, type **DISKCOPY A: A:** and press <Enter>. You can use DISKCOPY to transfer files to and from SuperDrive if it is the same size as your diskette.

## 4.5 Error Messages

SuperDrive shows error messages under the conditions described below.

### INVALID DRIVE SPECIFICATION....ABORTING

**Explanation:** This message indicates that either the system board switches were not set for the correct number of drives (see Section 2.4), or you used an invalid drive letter in your SuperDrive command.

**Action:** Set the system board switches for the correct number of drives. (See your AST board user's manual.) Do not select a drive specification letter other than A, B, C, or D.

### INSUFFICIENT MEMORY....ABORTING

**Explanation:** This message indicates that there is not enough unallocated memory available in the system to create a SuperDrive of any size.

**Action:** Reduce the amount of memory allocated to other SuperPak utilities, memory-resident programs, or applications in the system. If there is still insufficient memory to use SuperDrive, you will have to install additional memory in your system or remove SuperDrive.

### SHORT XXXXXX BYTES

**Explanation:** This message indicates that the SuperDrive you have just created is less than a standard sized drive. You will see it if you use the /M = xxx option to create a nonstandard drive, or if there were some memory available, but not quite enough to make the drive exactly the size you specified.

**Action:** No action is required. To create a standard sized drive, either reduce the amount of memory allocated to other SuperPak utilities or memory-resident programs, or increase your computer's memory.

If you see a message other than one of those while trying to initialize SuperDrive, it is a DOS error message described in your computer's DOS manual.

The SuperPak ASTCLOCK program sets and reads the time from the clock/calendar on your AST board. By adding commands for ASTCLOCK to your AUTOEXEC.BAT file, you will not have to set the date and time manually when you boot the computer.

Before you begin using ASTCLOCK, make sure the clock/calendar is enabled on your AST board. For more information, refer to your AST board's user manual.

### NOTE

Only use ASTCLOCK with the clock/calendar hardware on AST boards. Do not use ASTCLOCK with other manufacturer's clocks, including clocks built into the computer.

## 5.1 Installing ASTCLOCK

The SuperPak installation program can install the ASTCLOCK software automatically. If you have not installed the ASTCLOCK software, or if you do not have an AUTOEXEC.BAT file on your boot disk, follow this procedure:

### STEP 1

*Copy the SuperPak diskette:* If you have not already done so, copy the ASTCLOCK.COM program from the SuperPak diskette to your boot disk.

If you are unsure how to copy a file, consult your *DOS Manual*.

## STEP 2

*Edit the AUTOEXEC.BAT file:* Using a text editor or word processor, add the following command to your AUTOEXEC.BAT file:

### ASTCLOCK

If your boot disk has no AUTOEXEC.BAT file, create one with a text editor or word processor, or use the following sequence to create one from the DOS prompt (the only command in the file will be ASTCLOCK).

**COPY CON: AUTOEXEC.BAT<Enter>**

**ASTCLOCK<Enter>**

**<F6> <Enter>**

For more information about AUTOEXEC files or the DOS COPY command, see your *DOS Manual*.

### NOTE

If you want ASTCLOCK to display the date in European format (dd/mm/yy) when you boot the system, substitute the command ASTCLOCK/E for ASTCLOCK in your AUTOEXEC.BAT file. The /E parameter changes how ASTCLOCK shows the date, and not how the date is displayed by DOS and other applications.

## STEP 3

*Reboot your computer:* Press **<Ctrl>-<Alt>-<Del>**. The ASTCLOCK command will display the time and date on the screen. If necessary, use the ASTCLOCK /R parameter to set the time and date (Section 5.2).

## 5.2 Setting the Time and Date

Once you have copied ASTCLOCK to your boot disk, set the clock/calendar on the AST board. You will not need to set the clock/calendar again until you change the battery.

### STEP 1

*Start the computer:* Boot your system with the diskette or hard disk containing ASTCLOCK.COM and your revised AUTOEXEC.BAT file.

### STEP 2

*Start the ASTCLOCK setting procedure:* Change the default drive and directory to the one containing ASTCLOCK.COM. Enter this command:

**ASTCLOCK /R<Enter>**

The /R parameter keeps the ASTCLOCK program resident in memory and enables you to set the date and time. Typing ASTCLOCK without the /R parameter reads the date and time without loading the application.

You will see a message similar to the following (the actual date and time will be different):

A S T c l o c k   Version x.xx  
(c) Copyright AST Research, Inc.,  
1982, 1984, 1985.

Resident clock/calendar  
DATE & TIME processors loaded.

Current date is 08/15/88  
Current time is 08:07:56.65

## NOTE

If you want ASTCLOCK to display the date in European format (dd/mm/yy) when you enter this command, type **ASTCLOCK/R/E** instead of **ASTCLOCK/R**.

The /E parameter changes how ASTCLOCK shows the date, and not how the date is displayed by DOS and other applications.

### STEP 3

*Set the date:* Enter this command:

**DATE <Enter>**

Your PC will display the current date (the actual date displayed may be different):

Current date is Monday 8-15-1988  
Enter new date:

Enter the new month, day, and year as follows:

**mm-dd-yy <Enter>**

Replace *mm* with the one- or two-digit month designation, *dd* with the day, and *yy* with the year. Separate the month, day, and year with hyphens, slashes, or periods.

If you do not want to change the date, press <Enter> only.

**STEP 4**

*Set the time:* Enter this DOS command:

**TIME <Enter>**

Your computer will then display the current time (the actual time displayed may be different):

Current time is 8:14:15.82

Enter new time:

Enter the new hour, minute, and second as follows:

**hh:mm:ss <Enter>**

Substitute *hh* for the hour, *mm* for the minute, and *ss* for the second. Separate the hours, minutes, and seconds with colons. Use 24-hour format for the hour (that is, 1:00 PM = 13:00, 2:00 PM = 14:00, and so forth). Do not enter hundredths of a second.

If you do not want to change the time, press <**Enter**> only.

**NOTE**

For maximum accuracy, type in a time that is 10 to 15 seconds ahead of the actual time and press <**Enter**> when your watch or time signal indicates the time you typed.

**STEP 5**

*Reboot your computer:* Press <**Ctrl**>-<**Alt**>-<**Del**>. The computer will boot with the new date and time.

## NOTES

## USING SUPERPAK UTILITIES TOGETHER

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6

This section provides information on using SuperPak utilities together and with other applications.

### 6.1 Order of Installation

The SuperPak installation program will install SuperPak utilities in their correct order. You need to know the order in which SuperPak utilities are installed only if you write your own CONFIG.SYS and AUTOEXEC.BAT files.

Enter these commands in the following order:

- In the CONFIG.SYS file, enter the FASTDISK.SYS command. If you are installing expanded memory drivers, enter the commands for REMM.SYS and REX.SYS before FASTDISK.SYS.
- In the AUTOEXEC.BAT batch file, enter the SUPERDRV command to install SuperDrive . Do not use this command with PS/2 computers or AT-compatible computers with only one diskette drive.
- Enter the commands for SuperDrive followed by the SuperSpool commands.
- The ASTCLOCK command can appear anywhere in the AUTOEXEC.BAT file.

When you boot the computer, the commands in the CONFIG.SYS file are processed before AUTOEXEC.BAT. Therefore, fASTdisk will be installed before your other SuperPak utilities.

## 6.2 Program Compatibility

fASTdisk, SuperSpool, and SuperDrive function properly with DOS, BASIC, BASICA, and most DOS applications. There may be programs that will not work properly with RAM disks or print spoolers.

Some applications programs require specify memory ranges. Configure fASTdisk, SuperDrive, and SuperSpool to avoid using these areas.

Using SuperSpool with built-in printer buffers and other printer spoolers will slow down printing. Either remove SuperSpool or disable the other print spooler.

ASTCLOCK will only work properly with clock/calendar on AST boards. Do not use ASTCLOCK with other manufacturer's clock/calendars, including ones built into the computer. If you have more than one clock/calendar in your computer, enable only the AST clock/calendar for use with ASTCLOCK.

The utilities will function properly only with DOS, not with other operating systems.

## 6.3 Memory Requirements

fASTdisk, SuperSpool, and SuperDrive use certain parameters to control memory allocation. Follow these rules if you are installing more than one SuperPak utility:

- If you are using the /U parameter to reserve space for other programs, enter the same amount of reserved memory for all SuperPak utilities.
- To change the memory allocation for fASTdisk, SuperDrive or SuperSpool, modify the commands in the CONFIG.SYS and AUTOEXEC.BAT files and reboot the computer.

- To use extended memory for all SuperPak utilities, you need to add the /EXTM option only to the first fASTdisk command. All subsequent SuperPak options will be installed in extended memory. To install a SuperPak utility in conventional memory, use the /DEXTM option.

For information on memory allocation, see Appendix A.

## NOTES

## **PART II. APPENDICES**

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- A. Memory Allocation
- B. Creating AUTOEXEC.BAT and CONFIG.SYS Files
- C. Patching DOS for Additional Drives

## **NOTES**

## MEMORY ALLOCATION

---

A

The SuperPak installation program automatically selects the memory allocation for your SuperPak utilities. You do not need to change the basic memory configuration unless a SuperPak utility conflicts with an application, or you want to allocate a portion of memory for special programs.

This section provides information on how to allocate memory to SuperDrive, SuperSpool, and fASTdisk to make the best use of your particular configuration.

For more detailed information on the fASTdisk, SuperSpool, and SuperDrive command options, see Sections 2, 3, and 4, respectively.

### A.1 Memory Configuration

PC-compatible computers can contain the following types of memory:

- *Conventional memory*: Memory in the 0- to 640-KB range that can be addressed directly by DOS. All computers must have conventional memory.
  - Older PC- and XT-compatible computers divide conventional memory into two types depending on the switch settings:
    - *Low memory*: Conventional memory below the switch settings.
    - *High memory*: Conventional memory above the switch settings or 640 KB.

- *Reserved high memory:* Memory in the 640-KB to 1-MB range reserved for video RAM, the read only memory basic input/output system (ROM BIOS) and other system and peripheral functions. SuperPak utilities can use noncontiguous blocks of reserved high memory.
- *Extended memory:* Memory in the 1- to 16-MB address range that can be directly addressed by AT-compatible computers. PC- and XT-compatible computers can use expanded memory which emulates extended memory on memory expansion boards like Rampage/2.
- *Expanded (paged) memory:* Memory that swaps segments of information (called *pages*) in and out of conventional and reserved high memory to provide data space beyond the 640-KB DOS limit.

Conventional and extended memory are called *linear memory* since they use a continuous line of memory addresses.

Expanded memory is not part of the memory map. Instead, it is addressed by swapping memory pages in and out of conventional and reserved high memory.

SuperPak utilities are designed to run in linear memory. FASTdisk, SuperSpool, and SuperDrive can run in conventional or extended memory, or expanded memory emulating extended memory.

## A.2 How SuperPak Utilities Allocate Memory

The following example will help describe how SuperPak utilities use memory. An XT-compatible has 640 KB of conventional memory on the system board and a 2-MB Rampage/2 board. The Rampage/2 board uses 384 KB as emulated extended memory and the rest is used as expanded.

Figure A-1 shows this sample memory configuration.

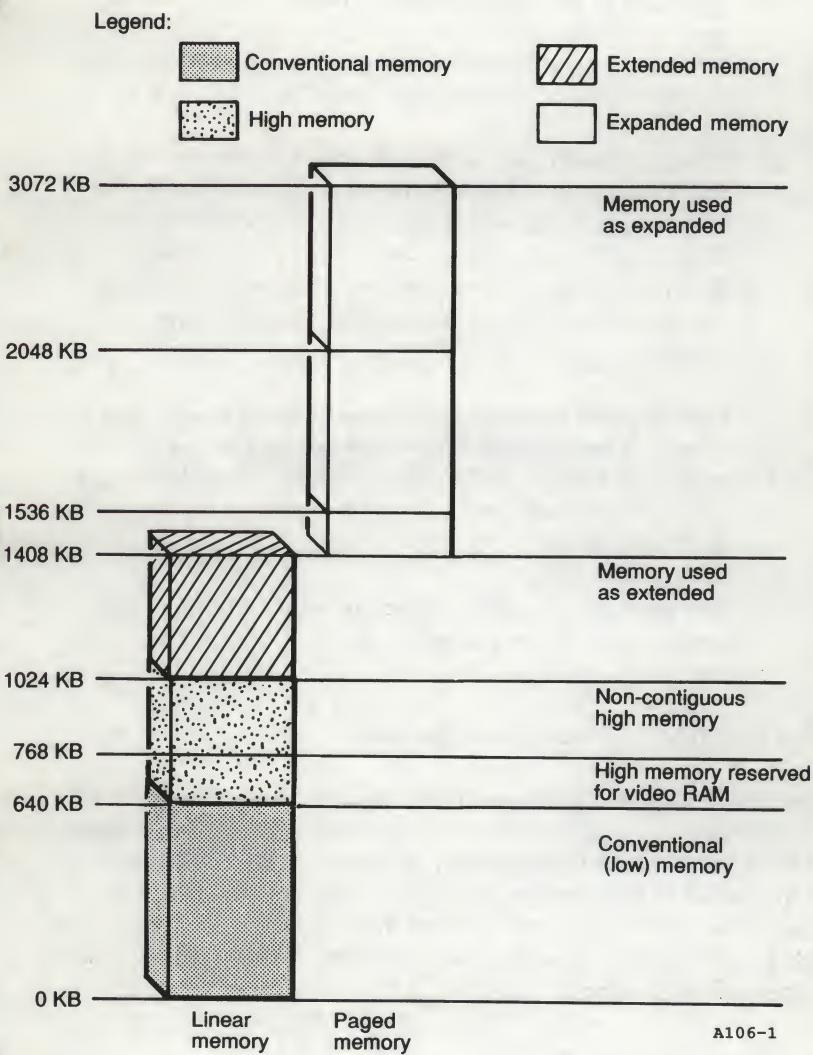


Figure A-1. Memory Configuration Example.

A106-1

The SuperPak utilities allocate memory in the following order:

1. Extended or extended memory emulated by expanded memory is used first if it is enabled by the /EXTM option. In this example, SuperPak utilities can use the 384 KB of emulated extended memory from 1024 to 1408 KB.
2. If there is insufficient memory for the SuperPak configuration in extended memory, the utilities will use noncontiguous reserved high memory above the 0C0000h (768 KB) address reserved for video RAM. Expanded memory also uses this space for paging, so the amount of memory available for SuperPak will be limited.
3. Conventional memory will be used if there is insufficient extended and reserved high memory for the SuperPak utilities or if the /DEXTM option is used. SuperPak utilities will reduce the amount of memory available for other applications.

The application portion of the SuperPak utilities always resides in conventional memory.

### A.3 Memory Allocation Options

Optional command parameters can be used to alter the default amount and areas of memory allocated by the SuperPak utilities. A brief description of the memory allocation options follows. (More detailed descriptions are found in Sections 2, 3, and 4). Each option described can be used in a command by adding it to the end of one of the basic command forms for the utilities described in Section 2.

### A.3.1 Allocating Memory to a Utility

SuperDrive, SuperSpool, and fASTdisk can use the /M = option to specify the amount of memory allocated for their use. The option has a slightly different format and usage for each utility.

With SuperDrive, you can use the /M option to reduce the drive's capacity. You cannot create a SuperDrive larger than the default (180 KB for single-sided, 360 KB for double-sided, and 1.2 MB for high-density diskettes). Both fASTdisk and SuperSpool use the /M option to decrease or increase the default memory allocation. If you use the /M option without specifying an amount, all available memory will be used for fASTdisk or SuperSpool.

#### Example

To create a double-sided, double-density SuperDrive with 200 KB of memory, and a SuperSpool with a 100-KB spool buffer (for a parallel printer), enter the following commands:

```
SUPERDRV C:/M=200  
SUPERSPL LPT1:/M=100
```

These commands do the following:

- The SUPERDRV C: command sets up a SuperDrive in its default configuration (double-sided, double-density) as drive C. The /M = 200 parameter limits the SuperDrive to 200 KB.
- The SUPERSPL LPT1: command sets up a SuperSpool for LPT1 in its default configuration. The /M = 100 parameter allocates 100 KB for the SuperSpool.
- A total of 300 KB is reserved for both SuperPak utilities.

### A.3.2 Reserving Memory for a Program

The /U option reserves memory for other applications and SuperPak utilities. Enter the same amount of reserved memory for each SuperPak utility command. (Only the amount specified in the most recent command remains reserved.)

Occasionally, you may want to use the /U=xxx option to reserve space for another SuperPak utility. In this case, specify different amounts of memory in different SuperPak utility commands.

For example, if you were to create a fASTdisk with an /M option assigning it all available memory, add the /U=400 option to reserve 400 KB for other programs. In a subsequent SuperSpool command, you could then include the /M and /U=300 options in order to use all remaining memory (minus the 300 KB) for a SuperDrive.

#### Example

A PC-compatible computer has 640 KB of conventional memory. To reserve 150 KB for use with applications programs (other than the SuperPak utilities) and create a 360-KB SuperDrive and a 100-KB fASTdisk, enter the following command in your CONFIG.SYS file:

**DEVICE=FASTDISK.SYS/M=100/U=150**

Enter the following command in your AUTOEXEC.BAT file:

**SUPERDRV C:/U=150**

These commands do the following:

- The DEVICE = FASTDISK.SYS command in the CONFIG.SYS file creates a fASTdisk upon booting the system. The /M = 100 option sets the fASTdisk size to 100 KB. The /U = 150 option instructs the computer to reserve a minimum of 150 KB for other applications. (Actually, 540 KB is still available.)
- The SUPERDRV C: command in the AUTOEXEC.BAT file creates a SuperDrive as drive C in its default configuration (double-sided, double-density). SuperDrive uses 360 KB. The /U = 150 option instructs the computer to reserve a minimum of 150 KB for other applications. (Actually, 180 KB is still available after allocating a total of 460 KB for SuperPak applications.)

### A.3.3 Enabling and Disabling Memory Regions

Several options are provided to enable or disable SuperPak utilities from using the certain types of memory.

- **/EXTM:** Enables SuperPak utilities to use extended memory or extended memory emulated by expanded. You may specify the amount of extended memory to be used and the starting address. Resident code for the SuperPak programs, and an intermediate buffer for SuperSpool, will still be located in conventional memory.

Once you use the /EXTM option for one SuperPak utility command, it applies to all subsequent SuperPak commands.

- **/DEXTM:** Enables SuperPak utilities to use conventional memory after the /EXTM command is used. Use this command to avoid conflicts with SuperPak utilities already installed in extended memory.

- */DL*, */DH*, and */DNC*: Disables the use of low, high, and noncontiguous reserved high memory, respectively, for older PC- and XT-compatible computer.

### Example

To install a 256-KB fASTdisk in a 512-KB range of extended memory starting at 1280 KB, enter the following command in your CONFIG.SYS file:

```
DEVICE=FASTDISK.SYS /M=256/EXTM=512,1280
```

This command does the following:

- The DEVICE = FASTDISK.SYS command sets up a fASTdisk upon booting the computer.
- The /M = 256 option allocates 256 KB for the fASTdisk.
- The /EXTM = 512,1280 option reserves 512 KB of extended memory starting at 1280 KB for this fASTdisk and subsequent SuperPak utilities.

## A.4 Memory Allocation for Conventional Memory

With the SuperPak installation program, you can easily install your utilities to fit your memory requirements. If you are creating your own CONFIG.SYS and AUTOEXEC.BAT files, you need to calculate your memory allocation before setting up your SuperPak utilities.

Computers with 640 KB or less require special planning. The following formula can help you to decide how to allocate your memory:

- xxxx KB Total actual memory installed.
  - 064 KB Approximate DOS requirement.
  - yyy KB Memory required by applications.
- 
- = zzzz KB Memory available for SuperPak utilities.

To specify memory allocations for SuperPak utilities, use the /U and /M options for all computers and the /DL, /DH, and /DNC options for older PC- and XT-compatible computers.

### Example

You have a PC-compatible computer with 640 KB total memory and double-sided diskettes. You want to create a double-sided SuperDrive as drive D, reserve 384 KB for your applications and use the remaining memory for SuperSpool. Your computer's memory will be allocated as follows:

- 640 KB Total actual memory installed.
  - 064 KB Approximate DOS requirement.
  - 384 KB Memory required by user program.
- 
- = 192 KB Memory available for SuperDrive and SuperSpool (approximate).

As you can see, there is not enough memory left to create an entire double-sided SuperDrive and SuperSpool. Instead, you can create a 160 KB SuperDrive and 32 KB SuperSpool. Enter the following commands:

```
SUPERDRV D:/U=384/M=160  
SUPERSPL LPT1:/U=384/M
```

These commands perform the following:

- The SUPERDRV D: command sets up a SuperDrive as drive D. Since the /I command is not used, no other drive designations are affected.
- The /U = 384 parameter reserves a minimum of 384 KB for other applications. This application memory is reserved before any memory can be allocated for SuperDrive.
- The /M = 160 parameter allocates 160 KB for SuperDrive. This is less than the default capacity for double-sided drives. Approximately 416 KB remains for other applications.
- The SUPERDRV LPT1: command sets up a SuperSpool for printer port LPT1.
- The /U = 384 parameter reserves a minimum of 384 KB for other applications. At this point, approximately 416 KB remains for other applications.
- The /M parameter indicates that all remaining memory will be used by SuperSpool (approximately 32 KB.)

When planning SuperPak configurations in conventional memory, be sure to leave enough memory for any applications you plan to run. See the application user's manual for minimum memory requirements.

## CREATING AUTOEXEC.BAT AND CONFIG.SYS FILES

B

---

Normally, the SuperPak installation program will create AUTOEXEC.BAT and CONFIG.SYS files or modify existing ones. This section will show you how to create and modify AUTOEXEC.BAT or CONFIG.SYS files, in case you need to modify SuperPak commands yourself.

AUTOEXEC.BAT and CONFIG.SYS are text files containing DOS commands. You can create these files with a text editor or word processor. Type each command on a single line and press <Enter>. Save your files in non-document or text-only mode.

If you do not have a word processor, you may create AUTOEXEC.BAT and CONFIG.SYS files directly from the keyboard as shown in the following sections.

### B.1 Creating an AUTOEXEC.BAT File

To create an AUTOEXEC.BAT file from DOS, start by entering the following command at the DOS prompt:

**COPY CON: AUTOEXEC.BAT<Enter>**

This command allows you to copy the information you will enter from the keyboard (also known as the *console*) into an AUTOEXEC.BAT file located on the diskette in your default drive.

After you enter the COPY command shown above, the cursor will drop down a line. Type each command to be included in your AUTOEXEC.BAT file on a separate line and end it by pressing <Enter>. To complete the file, press <F6> and then <Enter>.

The following example shows how to create an AUTOEXEC.BAT file from DOS with commands using SuperDrive and SuperSpool in default parameters.

**COPY CON: AUTOEXEC.BAT<Enter>**

**SUPERDRV C:<Enter>**

**SUPERSPL LPT1:<Enter>**

**<F6> <Enter>**

## B.2 Modifying an AUTOEXEC.BAT File

If you already have an AUTOEXEC.BAT file on your boot diskette or hard disk, and you want to edit it in DOS, do the following:

### STEP 1

*Determine what is currently in your AUTOEXEC.BAT file:* Change to the root directory of your hard disk or boot diskette. Enter the following:

**TYPE AUTOEXEC.BAT<Enter>**

You will see a listing of your AUTOEXEC.BAT file's contents.

### STEP 2

*Start a new AUTOEXEC.BAT file:* Enter the following command at the DOS prompt:

**COPY CON: AUTOEXEC.BAT<Enter>**

The cursor will drop down one line.

**STEP 3**

*Type the AUTOEXEC.BAT file commands:* Type in the contents of the AUTOEXEC.BAT file as it is listed on your screen, except add the SuperDrive and/or SuperSpool commands to the file in the appropriate location. (For example, if one of the commands in your AUTOEXEC.BAT file copies files to the SuperDrive, then your SuperDrive command must precede the COPY command.) Press <Enter> at the end of each line.

**STEP 4**

*Check the file carefully:* Ensure that all commands have been properly entered. After you have done this, press <F6> and then press <Enter> to close the file:

### B.3 Creating or Modifying a CONFIG.SYS File

The instructions for creating a CONFIG.SYS file from DOS are identical to those for creating an AUTOEXEC.BAT file, except that the COPY command would be as follows:

**COPY CON: CONFIG.SYS<Enter>**

The CONFIG.SYS file must reside on your boot diskette or in the hard disk root directory with your AUTOEXEC.BAT file.

## NOTES

## PATCHING DOS FOR ADDITIONAL DRIVES

---

C

DOS recognizes SuperDrive and treats it as a physical diskette drive. Under normal circumstances, you must set the system board switch to include SuperDrive in the total number of diskette drives (real and emulated).

If you experience difficulty in copying files between diskettes after you change the switch settings, you may need to patch DOS to recognize SuperDrive. This appendix provides programs to modify DOS to change the number of acceptable diskettes drives.

Since this procedure alters DOS, you may experience incompatibility with applications that also make DOS patches. If so, use your unaltered version of DOS with these programs.

To perform this procedure, you need to make a backup copy of your DOS boot diskette and a copy of DEBUG for your DOS version. Always modify a copy of your DOS diskette, not the original. Do not modify DOS on your hard disk.

These patches include variables for inserting the total number of diskette drives. Look up the corresponding values in Table C-1 and enter them where indicated in the programs.

**Table C-1. Variable Values for Setting the Number of Drives.**

| Switches Set for<br>One Drive |          | Switches Set for<br>Two Drives |          |
|-------------------------------|----------|--------------------------------|----------|
| xx = 40                       | 2 Drives | xx = C0                        | 3 Drives |
| xx = 80                       | 3 Drives | xx = 80                        | 4 Drives |
| xx = C0                       | 4 Drives |                                |          |
| yy = 02                       | 2 Drives | yy = 03                        | 3 Drives |
| yy = 03                       | 3 Drives | yy = 04                        | 4 Drives |
| yy = 04                       | 4 Drives |                                |          |

## C.1 Patching DOS 2.0 for Additional Drives

Boot the computer with a DOS 2.0 diskette containing DEBUG.COM. Make the diskette is not write-protected. To start the DEBUG program, type at the DOS prompt:

**DEBUG <Enter>**

Enter the following commands in order. Comments on the right side are for reference only. For more information, refer to the DEBUG program's user manual.

**-L100 0 10 1 <Enter>** Load the section from the diskette.

**-A10D <Enter>**  
**XOR SI,SI <Enter>**  
**PUSH SI <Enter>**  
**POP DS <Enter>**  
**XOR BYTE PTR [410],xx <Enter>**  
**PUSH CS <Enter>**  
**PUSH CS <Enter>**  
**POP DS <Enter>**  
**POP ES <Enter>**  
**MOV WORD PTR [SI],71B <Enter>**  
**POP AX <Enter>**  
**MOV AL,yy <Enter>**  
**NOP <Enter>**

**<Ctrl>-<Break>**

**-W100 0 10 1 <Enter>** Write patch to the diskette.

**-Q <Enter>** Quit DEBUG

**<Ctrl>-<Alt>-<Del>** Reboot the computer with this patched DOS 2.0 diskette.

## C.2 Patching DOS 2.1 for Four Drives

Boot the computer with a DOS 2.1 diskette containing DEBUG.COM. Make sure the diskette is not write-protected. To start the DEBUG program, type at the DOS prompt:

**DEBUG <Enter>**

Enter the following commands in order. Comments on the right side are for reference only. For more information, refer to the DEBUG program's user manual.

**-L100 0 10 1 <Enter>** Load section from the diskette.

**-A18A <Enter>**  
**XOR SI,SI <Enter>**  
**PUSH SI <Enter>**  
**POP DS <Enter>**  
**XOR BYTE PTR [410],xx <Enter>**  
**PUSH CS <Enter>**  
**PUSH CS <Enter>**  
**POP DS <Enter>**  
**POP ES <Enter>**  
**MOV WORD PTR [SI],798 <Enter>**  
**POP AX <Enter>**  
**MOV AL,yy <Enter>**  
**NOP <Enter>**

**<Ctrl>-<Break>**

**-W100 0 10 1 <Enter>** Write the patch to diskette.

**<Ctrl>-<Alt>-<Del>** Reboot the computer with this patched DOS 2.1 diskette.

### C.3 Patching DOS 3.0 for Four Drives

Boot the computer from drive A with a DOS 3.0 diskette containing DEBUG.COM. Make sure the diskette is not write-protected. Type the following command:

**DEBUG<Enter>**

Enter the following commands in order. Comments on the right side are for reference only. For more information, refer to the DEBUG program's user manual.

|  |   |
|--|---|
| <b>-L100 0 14 1&lt;Enter&gt;</b>   | Load the sector from diskette.                          |
| <b>-A23F&lt;Enter&gt;</b><br><b>XOR AX,AX&lt;Enter&gt;</b><br><b>MOV DS,AX&lt;Enter&gt;</b><br><b>OR BYTE PTR [410],C0&lt;Enter&gt;</b><br><b>MOV AL,4&lt;Enter&gt;</b><br><b>JMP 251&lt;Enter&gt;</b> |   |
| <br><b>&lt;Ctrl&gt;-&lt;Break&gt;</b>  |   |
| <br><b>-W100 0 14 1&lt;Enter&gt;</b>   | Write patch to diskette.                                |
| <br><b>&lt;Ctrl&gt;-&lt;Alt&gt;-&lt;Del&gt;</b>  | Reboot the computer with this patched DOS 3.0 diskette. |

## C.4 Patching DOS 3.1 for Four Drives

Boot the computer from drive A with a DOS 3.1 diskette containing DEBUG.COM. Make sure the diskette is not write-protected. Enter the following command:

**DEBUG <Enter>**

Enter the following commands in order. Comments on the right side are for reference only. For more information, refer to the DEBUG program's user manual.

**-L100 0 15 1<Enter>** Load sector from diskette.

**-A224<Enter>**  
**XOR AX,AX<Enter>**  
**MOV DS,AX<Enter>**  
**OR BYTE PTR [410],C0<Enter>**  
**MOV AL,4<Enter>**  
**JMP 236<Enter>**

**<Ctrl>-<Break>**

**-W100 0 15 1<Enter>** Write patch to diskette.

**<Ctrl>-<Alt>-<Del>** Reboot the computer with this patched DOS 3.1 diskette.

## GLOSSARY

---

### **Basic input/output system (BIOS)**

A set of low-level input and output routines the computer calls to perform its functions.

### **Buffer portion**

The data storage area of memory used by a SuperPak utility.

### **Byte**

The basic unit of measure for computer memory. A character -- such as a letter, number or punctuation mark -- uses one byte of memory. Computer memory is often measured in *kilobytes* (approximately one thousand bytes) or  *(about one million bytes).*

Each byte is made up of eight *bits*. For more information on bytes and bits, see an introductory book on computers.

### **Conventional memory**

Memory from 0 to 640 KB that is directly accessible by DOS. (Also called *base memory*.)

### **Device driver program**

A program that allows extra devices, such as disk drives or add-on boards, to be linked into DOS.

### **Enhanced Expanded Memory Specification (EEMS)**

An enhanced version of the expanded memory specification which provides a more flexible system for paging expanded memory. EEMS can be used by software that supports it.

**Expanded memory**

Also called *paged memory*, expanded memory is memory provided on expanded memory boards that is not allocated as part of the computer's conventional memory. Expanded memory is swapped in and out of windows in the address space recognizable by DOS, using special software device drivers.

**Extended memory**

Linear memory at or above 1 MB. On PC- and XT-compatible computers, expanded memory may be used to emulate extended.

**fASTdisk**

AST's program that uses RAM to emulate a fixed disk.

**Hexadecimal**

The base-16 numbering system. Numbers are represented by values from 0 to F (15). For example, the hexadecimal number 0100000h is equal to the decimal value 1,048,576.

**High memory**

On older PC and compatible computers, memory above the limit set by the system board switches.

**Kilobyte (KB)**

A unit of measure for memory. One KB is equal to 1024 bytes of memory.

**Linear memory**

Memory that can be addressed directly.

**Logical disk drive**

A device recognized by DOS as a diskette drive or hard disk whether it is mechanical or a RAM disk emulating a drive.

**Low memory**

Memory on PC, XT, and compatible computers below the limit set by the system board switches.

**Megabyte (MB)**

A unit of measure for memory. One MB is equal to one thousand kilobytes, or approximately one million bytes, of memory.

**Noncontiguous memory**

Available memory locations above video RAM in reserved high memory that can be used by SuperPak utilities.  
(See also *reserved high memory*.)

**Paged memory**

See *expanded memory*.

**Parameter**

A variable that changes a SuperPak utility's configuration. For example, the /EXTM = 0,1408 parameter enables fASTdisk, SuperSpool, or SuperDrive to use all extended memory starting at 1408 KB.

**Physical disk drive**

A mechanical diskette drive (not a RAM disk).

**Print spooler**

A program that allocates a portion of computer RAM as a printer buffer. AST's print spooler program is called *SuperSpool*.

A print spooler sends a file to be printed to a buffer rather than directly to the printer. The spooler then sends the file from the buffer to the printer. Once the file is stored in the buffer, the computer can do other work while the printer is printing.

**Rampage Expanded Memory Manager (REMM)**

REMM is a device driver program that enables your computer to use Rampage expanded memory with application programs.

**Random access memory (RAM)**

The computer's memory. Information can be written to and read from RAM.

**RAM disk**

A program that allows you to use part of the computer's memory as if it were a disk drive. *fASTdisk* program is a hard disk emulator. *SuperSpool* is a diskette drive emulator.

RAM disks are erased when the computer is turned off or rebooted. This means you must save data you want to keep on a diskette or hard disk.

**Read only memory (ROM)**

Computer memory that can be read but not overwritten. ROM is usually dedicated to a particular function, such as the *basic input/output system (BIOS)*.

**Reserved high memory**

Memory from 640 KB to 1024 KB reserved, for video RAM, ROM BIOS, and peripherals. SuperPak can use non-contiguous areas of reserved high memory for utilities. (See also *non-contiguous memory*.)

**Resident portion**

The program portion of either SuperDrive or SuperSpool, as opposed to the portion used for storing data (the buffer portion). Also refers to the program portion of the DOS MODE command used by SuperSpool.

**SuperSpool**

The AST program that allows you to use part of computer memory as a *print spooler*.

**User area**

The area of memory set aside by SuperPak utilities for the application software. SuperPak programs will not use memory in the area you specify.

**VDISK**

An IBM software product that allows you to create simulated hard disks in RAM.

**Video RAM**

A portion of reserved high memory provided by the display adapter board to store and process screen images.

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**Rampage® 286**  
**Enhanced Expanded Memory Board**  
for the  
**IBM Personal Computer AT®**  
**and XT Model 286**  
**and Other AT-Compatible Computers**

Addendum  
000432-002 A  
January 1988

AST RESEARCH, INC.  
Irvine, California  
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First Edition (January 1988)

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## **ADDENDUM TO THE RAMPAGE 286 USER'S MANUAL**

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This addendum updates miscellaneous packaging information and corrects technical details not covered in the current user's manual.

Please replace the original page with new pages from this addendum as follows:

### **Original Pages**

iii to viii  
1-1 to 1-2  
1-5 to 1-10  
2-1 to 2-14  
3-1 to 3-6  
4-5 to 4-6  
A-3 to A-10  
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iii to viii  
1-1 to 1-2  
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2-1 to 2-14  
3-1 to 3-8  
4-5 to 4-6  
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## **NOTES**

Rampage® 286 is a flexible and powerful memory enhancement board. It represents a new generation of products to expand the available memory for the IBM Personal Computer XT (PC XT) Model 286, PC AT®, and compatible computers. Rampage 286 offers these features:

- *Conventional memory.* Computer memory from 0 to 640 kilobytes (KB) is called conventional memory.

Your computer's system board contains a certain amount of conventional memory, and add-on boards (such as Rampage 286) can provide additional conventional memory. No matter how much memory you install in your computer, you can never have more than 640 KB of conventional memory. The Disk Operating System (DOS) can directly use all the conventional memory installed in your computer.

- *Extended memory.* Memory in the 1- to 16-megabyte (MB) address range is called extended memory. (Extended and conventional memory are also called *linear* or *non-paged* memory.)

Extended memory is used by the 80286 microprocessor when it operates in protected mode. (The *Technical Reference Manual* for your computer provides further information on protected mode.) Extended memory is used by the Operating System/2™ (OS/2) and XENIX™ operating systems, random access memory (RAM) disks and print spoolers. However, current versions of DOS and most application programs cannot use extended memory directly.

- *Expanded memory.* Memory above 640-KB that is made available by swapping segments of RAM in and out of conventional memory is called expanded or paged memory. Rampage 286 expanded memory supports expanded memory specification (EMS) software, including Lotus® 1-2-3 Release 2 and Symphony® 1.1. These applications use expanded memory by working with AST's expanded memory manager software, which is supplied with your Rampage 286 board.

Rampage 286 also supports the enhanced expanded memory specification (EEMS), providing superior performance with software written to support it, including Microsoft® Windows 2.0 and Quarterdeck DESQview™.

AST expanded memory software allows your computer to access up to 8 MB of memory (using four 2-MB AST expanded memory boards, including Rampage 286 and Advantage Premium™), while maintaining DOS compatibility.

#### NOTE

To ensure compatibility, use only AST expanded memory products (such as Advantage Premium) with Rampage 286.

- *Full compatibility with the Lotus/Intel/Microsoft (LIM) version 3.2 Expanded Memory Specification (EMS).* In addition, AST's EEMS offers a more flexible paging scheme that maximizes software performance and exceeds the capabilities of the LIM EMS.

## 1.1 Features

Rampage 286 hardware and software features are described in this section.

- *SuperSpool*™, an intelligent print spooler that allows you to send files to a printer while freeing your computer for other tasks.
- *INSTALL*, a software installation utility that allows easy installation of the fASTdisk, SuperDrive, SuperSpool, and expanded memory software.

#### NOTE

You must use a version 6.10 (or later) SuperPak diskette with Rampage 286. All your SuperPak software is fully compatible with earlier versions of AST products.

### 1.2 Memory Allocation Example

A typical example of how Rampage 286 memory can be allocated is presented in this section. Suppose your computer has 512 KB of conventional memory installed and your Rampage 286 provides 2 MB of RAM. You would like to use Rampage 286 to do the following:

- Fill out conventional memory to 640 KB.
- Allocate extended memory to create a 384-KB fASTdisk.
- Use all remaining Rampage 286 memory as expanded memory for use with EMS or EEMS application programs.

Set Rampage 286 for 512 KB of conventional/extended memory already installed in your computer and allocate 512 KB of Rampage 286 memory as conventional/extended memory, -- 128 KB are used to round out conventional memory and 384 KB as extended memory. The remaining 1536 KB (1.5 MB) of Rampage 286 memory would be used as expanded memory.

Memory addressed between 640 and 1024 KB, called *high memory*, is reserved for video graphics adapters and other DOS utilities. This memory comes from the read only memory basic input/output system (ROM BIOS), display adapter, disk controller, and other peripheral devices in your computer. Rampage 286 uses a portion of high memory for paging expanded memory. High memory is not counted as part of conventional or extended memory.

Figure 1-1 shows how the different types of memory are used in the computer. In this example, your computer has a total of 2560 KB including 512 KB on the system board, 2048 KB on the Rampage 286 board, and 384 KB of reserved memory. When you start the computer, it counts only the total conventional and extended memory. Therefore, you will see 1024 KB in the upper-left corner of the screen when you boot the computer (640 KB conventional memory plus 384 KB extended memory).

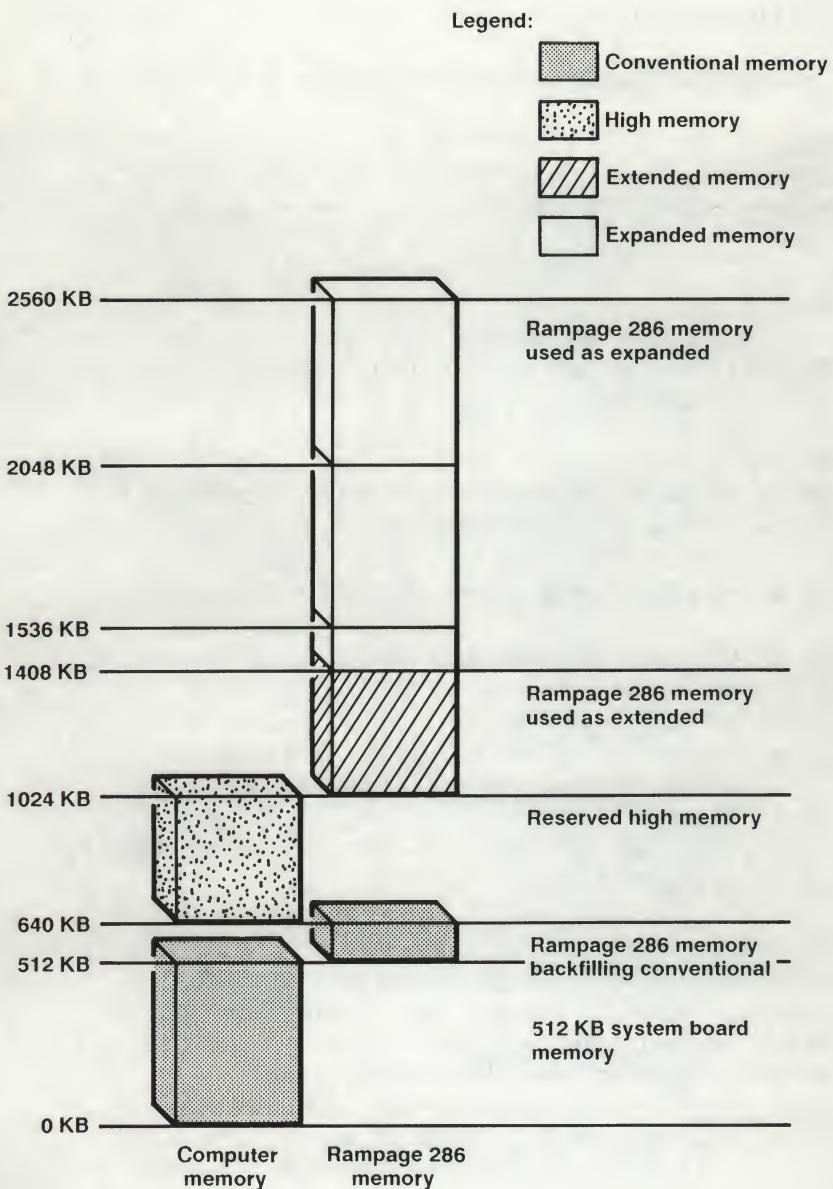


Figure 1-1. Total Memory.

## 1.3 Getting Started

This section tells you how to get started with your Rampage 286.

### STEP 1

*Check the contents of your Rampage 286 package.* Section 1.4 provides a checklist of what should be included with your package.

### STEP 2

*Review the system requirements for Rampage 286.* Read Section 1.5 to make sure your system meets the requirements for using Rampage 286.

### STEP 3

*Decide on the configuration you need.* How you configure Rampage 286 depends on the following:

- How much memory is already installed in your computer.
- How much Rampage 286 memory you want to allocate as expanded memory.
- Whether you have an AST Advantage Premium or another Rampage 286 board installed in your PC.

Section 2 provides further help in determining how to configure your Rampage 286 board.

### STEP 4

*Configure Rampage 286.* Based on the requirements you determined in STEP 3, set the switches on your Rampage 286 board. You can use the configuration set at the factory (the default configuration) under these circumstances:

- You are installing Rampage 286 in a computer that has 512 kilobytes (KB) of conventional memory installed.
- No other expanded memory board is installed in your system.

If the default configuration does not meet your needs, reconfigure the board as shown in Section 2.

### **STEP 5**

*Configure the PC AT system board.* To improve the performance of EEMS software, you may disable part of the system board's memory and backfill it with Rampage 286 memory. This procedure gives the EEMS software more conventional memory to use for paging. See Section 3 for instructions on setting the system board's jumper or switch block for the amount of memory.

### **STEP 6**

*Install Rampage 286.* Once the Rampage 286 board is configured, you must install it in your PC. Follow the instructions in Section 3.

### **STEP 7**

*Run the SETUP program.* Whenever you change your memory configuration, and you plan to add a SuperDrive RAM disk drive, you need to run the SETUP program provided with your computer. Section 4 gives examples of what parameters you should supply while you are running SETUP.

### **STEP 8**

*Install the Rampage 286 software.* Section 5 shows you how to use INSTALL to configure and install the Rampage 286 software.

### **STEP 9**

*Start your application software package.* Rampage 286 is compatible with EMS and EEMS software. Follow the instructions provided with your software to install and use it.

## 1.4 Checklist

In addition to this user's manual (AST part number 000432-001), your Rampage 286 package includes the following items:

- Rampage 286 full-size expanded memory board.
- SuperPak diskette (version 6.10 or later).
- *SuperPak User's Manual* (000300-001).

## 1.5 System Requirements

The minimum hardware requirements using Rampage 286 is an AT-compatible computer with at least one floppy drive, an unused dual-connector expansion slot, and a bus speed of 8 megahertz (MHz) or less. (See your computer's user manual for the bus speed.) Compatible computers include the IBM PC XT Model 286, PC AT, and other computers with AT-equivalent expansion buses.

Rampage 286 will also run in a PC XT (or compatible) with the AST's Xformer/286™ replacement system board with a bus speed of 10 MHz (requires Rampage 286 version 02A or later).

Rampage 286 is compatible with DOS 2.0, or later, or OS/2 on machines that support it.

This section gives a step-by-step procedure for configuring the Rampage 286 board. It provides the information you need to configure your board in most circumstances.

Section 2.1 shows the Rampage 286 default configuration (how the board is configured at the factory). If the default configuration meets your needs, you can skip directly to Section 3.

If you need to change any of the settings, Section 2.2 leads you step-by-step through each switch and jumper setting.

## 2.1 Default Configuration

Rampage 286 is shipped from the factory in this configuration:

- Your computer has 512 KB of conventional memory already installed.
- Rampage 286 uses 128 KB to backfill conventional memory. The rest of the Rampage 286 memory is used as expanded.
- Multitasking is enabled.
- The base I/O address is 0218h.

If the default settings are appropriate for your system, you can skip directly to Section 3, with no further configuration. Figure 2-1 shows the default configuration which is explained in Table 2-1.

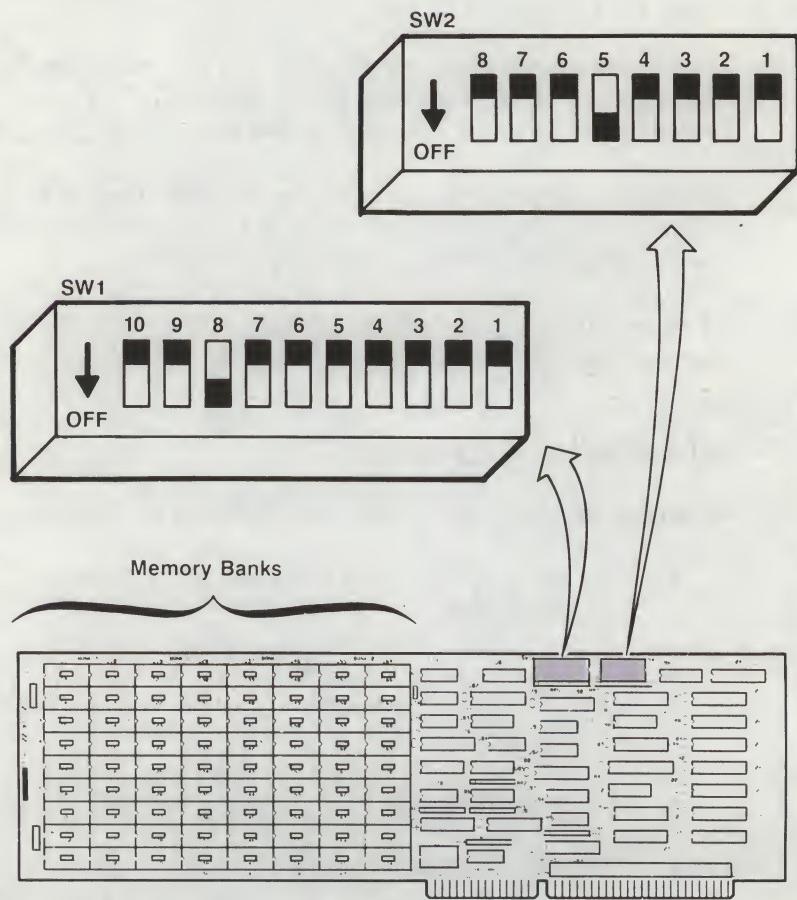


Figure 2-1. Rampage 286 Board Layout.

**Table 2-1. Rampage 286 Default Configuration.**

| Parameter  | Default   | Comments  |
|--|---|---|
| <i>Expanded Memory Parameters</i>                  |   |   |
| Rampage 286 conventional/<br>extended memory size  | 128 KB<br>(SW1-1 ON<br>SW1-2 ON<br>SW1-3 ON<br>SW1-4 ON)                                      | The amount of Rampage 286 memory that can be allocated as conventional or extended memory. Remaining Rampage 286 memory is used as expanded memory.   |
| Base I/O address                                   | 0218h<br>(SW1-5 ON<br>SW1-6 ON<br>SW1-7 ON<br>SW1-8 OFF)                                      | Rampage 286 uses the I/O address to communicate with the computer, allowing it to use expanded memory. Do <i>not</i> change this parameter unless you are installing more than one Rampage 286 board in your system, or another device (such as an Advantage Premium) in your PC uses the same I/O address range. |
| Dual Page mode                                     | Enabled<br>(SW1-9 ON)   | Ensures proper multitasking operation (allows two sets of Mapping registers to be used).  |
| <i>Conventional/Extended Memory Configuration</i>  |   |   |
| Conventional/<br>extended memory already installed | 512 KB<br>(SW2-1 ON<br>SW2-2 ON<br>SW2-3 ON<br>SW2-4 ON<br>SW2-5 OFF<br>SW2-6 ON<br>SW2-7 ON) | Change this setting if your computer has other than 512 KB of conventional memory already installed or if you want to address additional Rampage 286 memory below 640 KB to enhance multitasking  |
| Parity checking                                    | Enabled<br>(SW2-8 ON)   | Parity checking enables memory error checking. To ensure reliability, do not disable.   |

## 2.2 Basic Configuration

This section tells you what you need to know before you configure Rampage 286, then guides you step-by-step through each switch setting on the board.

### 2.2.1 What You Need to Know Before You Start

Before you change the configuration of your Rampage 286 board, you need to answer the following questions.

*A. Are there any other expanded memory boards installed in your computer?*

If your computer includes any other AST expanded memory boards (for example, AST's Advantage Premium board), make sure their base I/O and memory addresses do not conflict. Use only AST expanded memory boards together with Rampage 286 in the same machine.

*B. How much conventional/extended memory is already installed in your computer?*

One of the Rampage 286 switch settings is the total amount of conventional and extended memory already installed in your computer. Memory between 0 and 640 KB is called *conventional memory*. Memory in the range from 1 megabyte (MB) to 16 MB is called *extended memory*. (The range from 640 KB to 1 MB is called *high memory*. Portions of memory in this range are reserved for video display buffer memory and other DOS housekeeping functions.)

If you are not sure how much conventional/extended memory is installed in your computer, boot the computer and note the total amount of memory displayed in the upper-left corner of the screen. This total shown includes memory on the system and other memory boards.

You will need to separate total linear memory into conventional and extended memory when you run the SETUP program after your Rampage 286 is installed. Subtract 640 KB from your total linear memory. Any remainder is extended memory. If your total linear memory is less than 640 KB, it is all conventional.

*C. How much Rampage 286 memory do you want to allocate as conventional memory?*

If your computer has less than 640 KB of conventional memory installed, allocate enough Rampage 286 memory to round out your conventional memory to 640 KB.

To determine how much Rampage 286 memory to allocate as conventional memory, note the amount of memory displayed when booting the computer. If more than 640 KB is displayed, you already have a full 640 KB of conventional memory.

*D. How much Rampage 286 memory do you want to allocate as extended memory?*

Extended memory is linear memory from 1 to 16 MB.

Most application programs are not able to use extended memory. If you plan to use RAM disks, print spoolers, XENIX, or Operating System/2™ (OS/2), you may use the Rampage 286 board switches to allocate extended memory.

If you want to use extended memory only for RAM disks (AST's SuperDrive and fASTdisk) or AST's SuperSpool print spooler program, the SuperPak INSTALL program will automatically allocate Rampage 286 expanded memory as emulated extended memory. That way, you need not worry about setting your Rampage 286 hardware switches to allocate Rampage 286 memory as extended memory.

*E. How much Rampage 286 memory do you want to allocate as conventional/extended memory?*

Add your totals from D and E together to get the total Rampage 286 memory that you want to allocate as conventional and extended memory. One of your Rampage 286 switch settings is set according to this total.

The following sections take you step-by-step through the configuration of the two switches on your Rampage 286 board.

### 2.2.2 SW1 Location and Default Settings

Figure 2-2 shows the location and default setting for SW1.

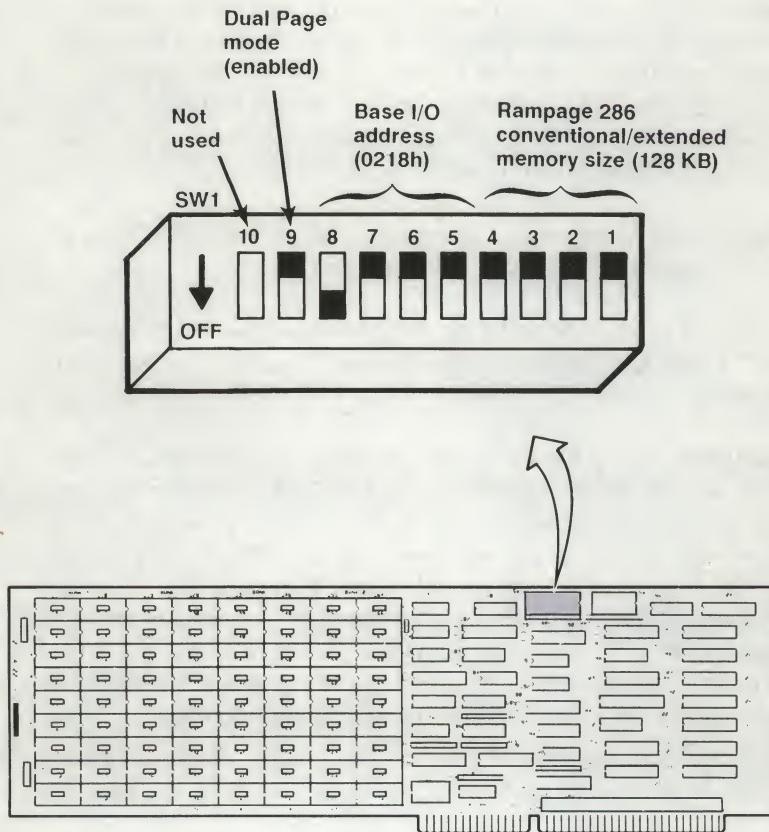


Figure 2-2. Rampage 286 Switch SW1  
(Default Setting).

### **2.2.3 Conventional/Extended Memory Size Setting (SW1-1 through SW1-4)**

Switches SW1-1 through SW1-4 determine the amount of Rampage 286 memory to be used as conventional/extended memory. The default position for these switches sets Rampage 286 conventional/extended memory size to 128 KB. Leave switches SW1-1 through SW1-4 in their default settings if your computer has 512 KB of system memory installed and you want to backfill conventional memory to 640 KB.

If you do not want to use the default setting, then set switches SW1-1 through SW1-4 as shown in Table 2-2.

To use all of Rampage 286 memory as expanded memory, set SW2-1 through SW2-7 to OFF. SW1-1 through SW1-4 will then be ignored.

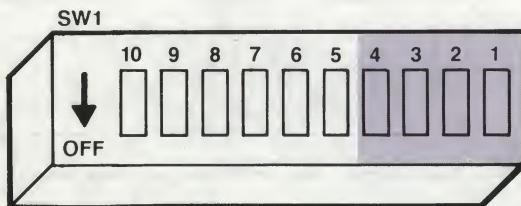
If you plan to use Rampage 286 extended memory only for AST RAM disks and print spooler (or IBM's VDISK), the simplest option is to set these switches only for the conventional memory amount needed to round out system memory to 640 KB. The SuperPak INSTALL program automatically causes Rampage 286 expanded memory to emulate the required amount of extended memory by installing REX.SYS on your boot disk with the SuperPak INSTALL program. This eliminates the need to set Rampage 286 switches for extended memory and makes reconfiguration easy.

**Table 2-2. Rampage 286 Conventional/Extended Memory Size.**

| Rampage 286<br>Conventional/Extended<br>Memory Size * | SW1-1 | SW1-2 | SW1-3 | SW1-4 |
|---|-------|-------|-------|-------|
| ** 128 KB   | ON    | ON    | ON    | ON    |
| 256 KB  | ON    | ON    | ON    | OFF   |
| 384 KB  | ON    | ON    | OFF   | ON    |
| 512 KB  | ON    | ON    | OFF   | OFF   |
| 640 KB  | ON    | OFF   | ON    | ON    |
| 768 KB  | ON    | OFF   | ON    | OFF   |
| 896 KB  | ON    | OFF   | OFF   | ON    |
| 1024 KB   | ON    | OFF   | OFF   | OFF   |
| 1152 KB   | OFF   | ON    | ON    | ON    |
| 1280 KB   | OFF   | ON    | ON    | OFF   |
| 1408 KB   | OFF   | ON    | OFF   | ON    |
| 1536 KB   | OFF   | ON    | OFF   | OFF   |
| 1664 KB   | OFF   | OFF   | ON    | ON    |
| 1792 KB   | OFF   | OFF   | ON    | OFF   |
| 1920 KB   | OFF   | OFF   | OFF   | ON    |
| 2048 KB   | OFF   | OFF   | OFF   | OFF   |

\* These settings are ignored if all Rampage 286 memory is to be used as expanded memory (SW2-1 through SW2-7 OFF).

\*\* Default setting.



### 2.2.4 Base I/O Address Settings (SW1-5 through SW1-8)

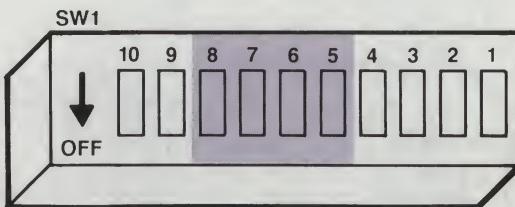
Switches SW1-5 through SW1-8 determine the base I/O address. The default position for these switches sets the Rampage 286 base I/O address to 0218h. Leave SW1-5 through SW1-8 in the default positions unless you have another board in your computer with base I/O address 0218h.

If you have another expanded memory board in your computer (such as another Rampage 286 or an Advantage Premium), or another device with a conflicting I/O address, configure Rampage 286 to use a different base I/O address (Table 2-3 summarizes the possible base I/O addresses).

**Table 2-3. Rampage 286 Base I/O Address.**

| Base I/O Address | SW1-5 | SW1-6 | SW1-7 | SW1-8 |
|------------------|-------|-------|-------|-------|
| 0208             | ON    | ON    | ON    | ON    |
| *0218            | ON    | ON    | ON    | OFF   |
| 0258             | ON    | OFF   | ON    | OFF   |
| 0268             | ON    | OFF   | OFF   | ON    |
| 02A8             | OFF   | ON    | OFF   | ON    |
| 02B8             | OFF   | ON    | OFF   | OFF   |
| 02E8             | OFF   | OFF   | OFF   | ON    |

\*Default setting



**NOTE**

When you select base I/O address 02x8h,  
Rampage 286 uses the following addresses:

02x8h, 42x8h, 82x8h, C2x8h,  
02x9h, 42x9h, 82x9h, C2x9h

For example, selecting base I/O address 0208h  
causes the Rampage 286 board to use I/O  
addresses 0208h, 4208h, 8208h, C208h, 0209h,  
4209h, 8209h, and C209h.

**2.2.5 Dual Page Mode (SW1-9)**

Switch position SW1-9 selects Dual Page mode which enables  
Rampage 286 to run several operations at once (called  
*multitasking*). Turn switch SW1-9 on to enable Dual Page mode.  
Under normal conditions, SW1-9 should be left on.

**NOTE**

Switch SW1-10 is not used. It can be left on or  
off.

### 2.2.6 SW2 Location and Default Settings

Figure 2-3 shows the location and default setting for SW2.

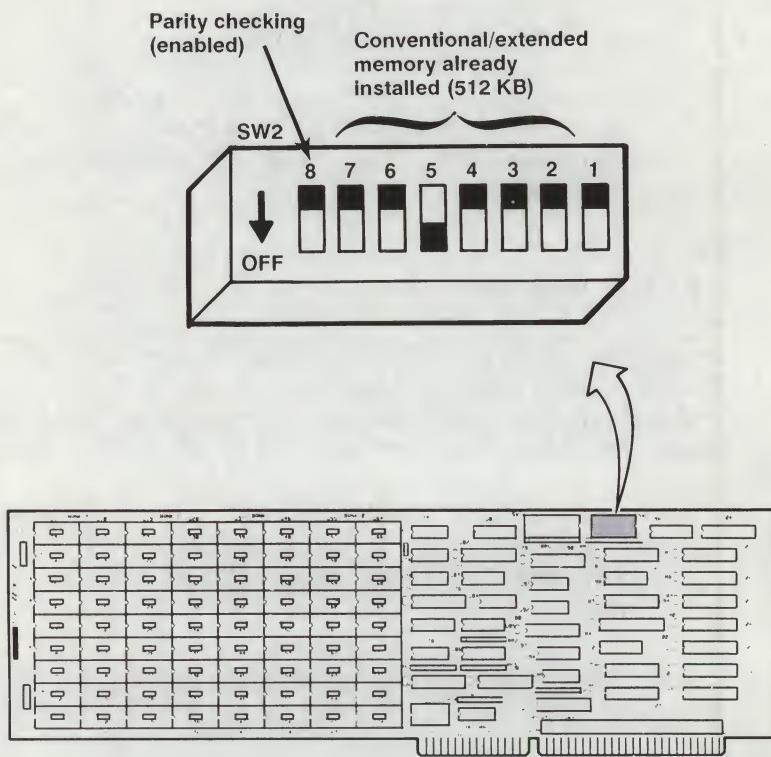


Figure 2-3. Rampage 286 Switch SW2 (Default Setting).

### **2.2.7 Conventional/Extended Memory Installed (SW2-1 through SW2-7)**

The amount of conventional/extended memory already installed in your computer before adding Rampage 286 determines how you should set switch positions SW2-1 through SW2-7.

Leave switches SW2-1 through SW2-7 in their default setting if your computer has 512 KB already installed.

To use all of Rampage 286 memory as expanded memory, turn off switches SW2-1 through SW2-7.

Appendix A gives all the switch settings for this parameter.

### **2.2.8 Parity Checking (SW2-8)**

Switch position SW2-8 enables or disables parity checking. By default, SW2-8 is ON, enabling parity checking. Leave SW2-8 on unless you have a special reason to disable parity checking. Only under rare circumstances would you change this setting.

## NOTES

# INSTALLING RAMPAGE 286 IN YOUR COMPUTER

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3

This section provides installation instructions, including:

- Preparing your computer for installing Rampage 286 (Section 3.1).
- Installing the board in your computer (Section 3.2).

## 3.1 Opening Your Computer

This section tells you how to set up your computer before installing Rampage 286.

### CAUTION

Be sure that the power switch is off and the power cord is removed from the wall outlet. Turn off any other equipment connected to the computer. Installing any component while the power is on can permanently damage your computer and its components.

You will need a flathead screwdriver or nut driver to perform the following procedure.

Depending on the type of computer you have, follow these instructions to remove the cover. (For more information, see your computer's user manual.)

*PC XT Model 286:* Use a flathead screwdriver or nut driver to remove the cover mounting screws from the rear panel of the computer. Once you have remove the cover mounting screws, pull the cover off as shown in Figure 3-1.

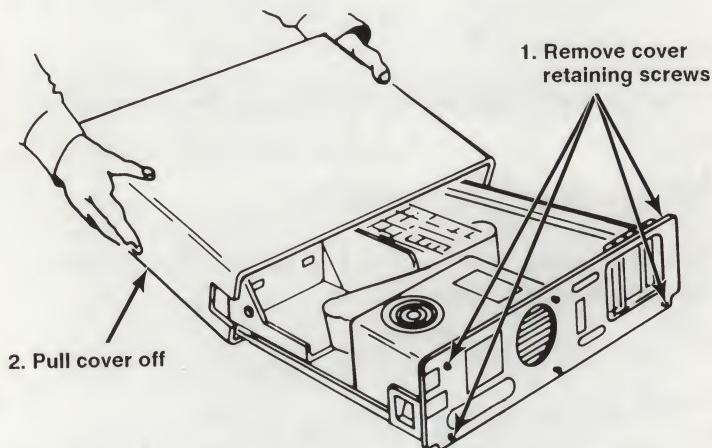
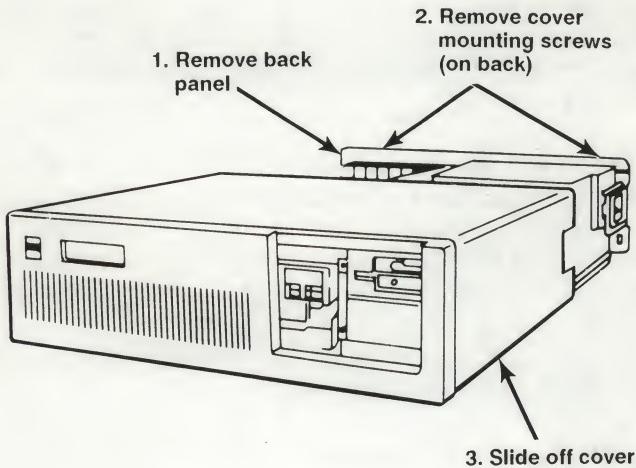


Figure 3-1. Removing the PC XT Model 286 Cover.

**PC AT:** Unlock the key lock at the front of the PC AT by turning the key counterclockwise. Remove the back panel (attached with plastic fastener strips) from the rear of the computer. Use a flathead screwdriver or nut driver to remove the cover mounting screws. Slide the cover toward the front until it comes off, as shown in Figure 3-2.



**Figure 3-2. Removing the PC AT Cover.**

### 3.2 Disabling System Board Memory

You can enhance the performance of EEMS software by disabling all or part of the system board memory and using Rampage 286 to backfill conventional memory.

Paging takes place in conventional memory. System board memory is not mapped, so it cannot be used for paging.

Rampage 286 memory is mapped, and paging can occur where Rampage 286 backfills conventional memory. The more conventional memory Rampage 286 backfills, the more memory is available for paging.

On the IBM PC AT and most compatible computers, you can set the amount of recognized system board memory by setting a jumper or switch. Rampage 286 will backfill conventional memory to 640 KB from the amount set by the jumper. By disabling part of system board memory, Advantage Premium will backfill more conventional memory, which improves the performance of EEMS and multitasking software, such as Microsoft Windows 2.0 and DESQview.

The instructions shown here are for the IBM PC AT. If your computer is configured differently, see the computer's user manual for instructions.

While the computer cover is off, follow these steps to set the jumper:

#### STEP 1

*Lift the disk controller board:* To reach the jumper, you need to remove the disk controller board. Remove the disk controller board's bracket retaining screw and save it. Carefully lift the board about two inches. Be careful not to pull on the ribbon cables attached to the board.

**STEP 2**

*Set the jumper:* Locate jumper J18 toward the front of the computer. Set the jumper for the appropriate amount of memory, either 256 KB or 512 KB.

If you have 512 KB of memory on the system board, you may leave the jumper in the 512 KB position, or set it to 256 KB to backfill. If you have 256 KB on the system board, leave the jumper in the 256 KB position. Do not set it for 512 KB. (See Figure 3-3.)

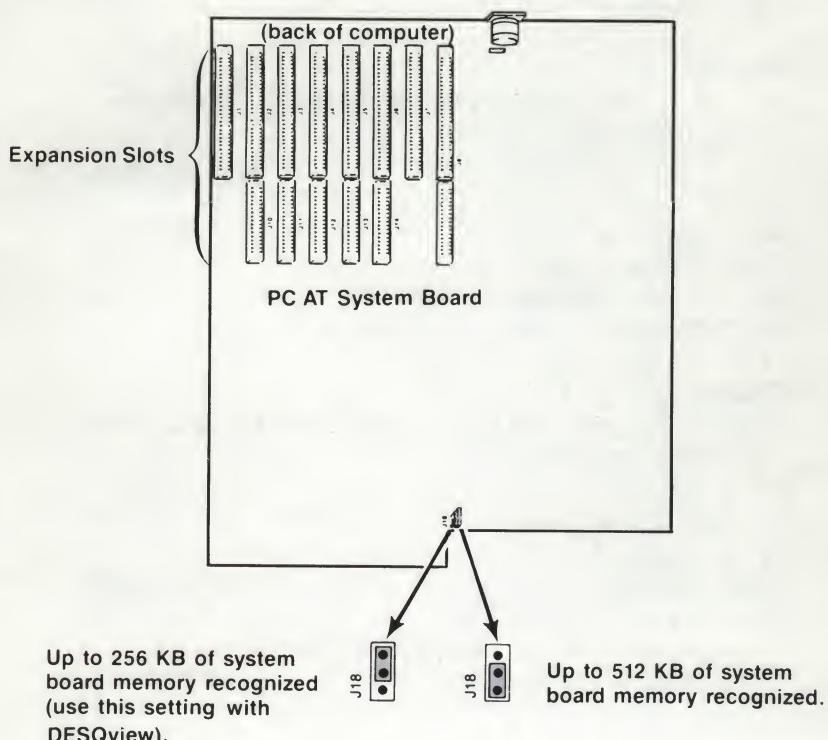


Figure 3-3. Setting the PC AT System Board Jumper.

**CAUTION**

Do not remove memory chips from the PC AT system board, regardless of the jumper setting.

### **STEP 3**

*Replace the disk controller board:* Carefully press down on the disk controller board until it is completely inserted into the slot. Be sure all ribbon cables are securely attached. Replace the bracket retaining screw you removed earlier.

## **3.3 Installing Rampage 286 in Your Computer**

This section tells you how to install the Rampage 286 board into your computer.

### **STEP 1**

*Select an open expansion slot:* Rampage 286 requires one dual-connector slot.

### **STEP 2**

*Remove expansion slot cover:* On the back panel, locate the metal cover for the slot that you have selected. Remove the bracket retaining screw with a small flathead screwdriver and save it. Remove the expansion slot cover.

### **STEP 3**

*Install the Rampage 286 board:* Line up your Rampage 286 board and position its front bottom corner in the card guide channel. Position any wires or ribbon cables so they will pass either beneath or above the installed board and will not be damaged during installation. Lower the board until its edge connector rests on the expansion slot receptacle. Using an evenly distributed pressure, press the Rampage 286 board straight down until it is completely inserted into the expansion slot (Figure 3-4).

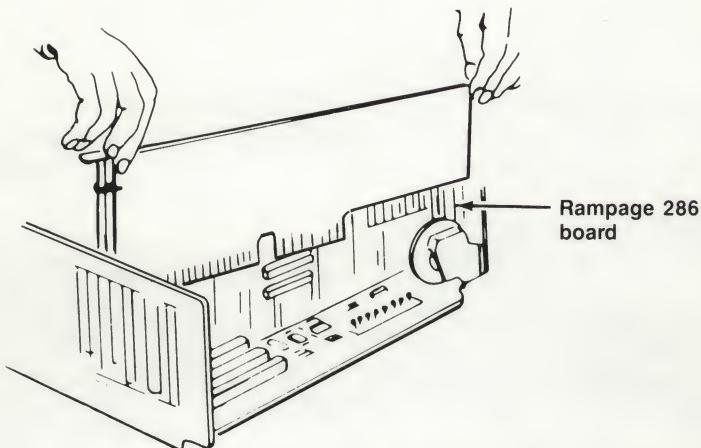


Figure 3-4. Installing the Rampage 286 Board.

#### STEP 4

*Secure the board to the rear of the chassis:* Use the screw you removed from the expansion slot cover in Step 2.

#### STEP 5

*Replace the cover:* Carefully slide the cover from the front until it stops securely against the rear panel. Reinstall the cover mounting screws you removed earlier.

If you have a PC AT, press the back panel so that the plastic fastener strips secure it in place.

#### STEP 6

*Install cables:* Replace the power cord to the system unit and be sure that the keyboard and the monitor connectors are plugged in. Reattach any other cables and connectors you removed previously.

Now you are ready to start the computer. Run the SETUP program whenever you add or subtract conventional or extended memory from your computer. The SETUP program is included on the diagnostics diskette that comes with your computer. Section 5 gives several examples of how to run the SETUP program.

You must also run SETUP if you plan to change the number of floppy disk drives (including the SuperDrive RAM disk emulation program) in your computer.

Enter the amount of memory installed above 1 MB (the amount does not necessarily have to be expressed in 512-KB increments, as implied in the display above). Press <Enter> to proceed with SETUP.

### STEP 6

*Verify that all SETUP options are set correctly:* SETUP will then display the options for disk type, memory size, and adapter type. If all options are correct, press Y to reboot.

## 4.1 SETUP Examples

This section gives several sample Rampage 286 configurations and provides the appropriate SETUP parameters.

**Example 1:** Your PC AT has 256 KB of conventional memory installed, and you have a 512-KB Rampage 286 board. You want to use 384 KB of Rampage 286 memory to fill out conventional memory to 640 KB, and you want to allocate 128 KB as extended memory (memory addressed above 1 MB). Specify the following:

Base memory size: 640  
Extended memory size: 128

**Example 2:** Your IBM PC XT with the Xformer/286 system board replacement has 512 KB of conventional memory installed, and you have a 512-KB Rampage 286 board. You want to use 128 KB of Rampage 286 memory to fill out conventional memory to 640 KB, and you want to allocate 384 KB as extended memory. Specify the following:

Base memory size: 640  
Extended memory size: 384

**Example 3:** Your PC XT Model 286 has 512 KB of conventional memory installed, and you have a 2-MB Rampage 286 board. You want to use 128 KB of Rampage 286 memory to fill out

conventional memory to 640 KB, and you want to allocate all remaining memory (1920 KB) as expanded memory. Specify the following:

Base memory size: 640  
Extended memory size: 0

**Example 4:** Your PC AT has 512 KB of conventional memory installed, and you have a 2-MB Rampage 286 board. You want to use 128 KB of Rampage 286 memory to fill out conventional memory to 640 KB, 384 KB as extended memory, and all remaining memory (1536 KB, 2048 minus 128 minus 384) as expanded memory. Specify the following:

Base memory size: 640  
Extended memory size: 384

**Example 5:** Your PC AT has 256 KB of conventional memory installed, and you have one 2-MB Rampage 286 board and one 2-MB Advantage Premium board. You want to use 384 KB of Rampage 286 memory to fill out conventional memory to 640 KB, 1 MB as expanded (paged) memory, and all remaining memory (2688 KB) as extended memory (memory addressed above 1 MB). Specify the following:

Base memory size: 640  
Extended memory size: 2688

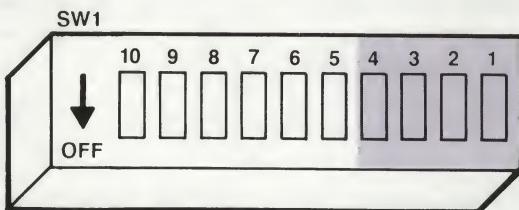
Enhanced Expanded Memory Specification software works best when as much Rampage 286 memory as possible is allocated as conventional memory.

If you have a PC AT, it is possible to allocate as much as 384 KB of Rampage 286 memory as conventional memory.

If you have a PC XT Model 286 with 512 KB installed, you can allocate up to 128 KB of Rampage 286 memory as conventional memory. If your PC XT Model 286 has 640 KB installed, do not allocate any Rampage 286 memory as conventional memory.

| <b>Rampage 286<br/>Conventional/Extended<br/>Memory Size</b> | <b>SW1-1</b> | <b>SW1-2</b> | <b>SW1-3</b> | <b>SW1-4</b> |
|--|--------------|--------------|--------------|--------------|
| * 128 KB   | ON           | ON           | ON           | ON           |
| 256 KB   | ON           | ON           | ON           | OFF          |
| 384 KB   | ON           | ON           | OFF          | ON           |
| 512 KB   | ON           | ON           | OFF          | OFF          |
| 640 KB   | ON           | OFF          | ON           | ON           |
| 768 KB   | ON           | OFF          | ON           | OFF          |
| 896 KB   | ON           | OFF          | OFF          | ON           |
| 1024 KB  | ON           | OFF          | OFF          | OFF          |
| 1152 KB  | OFF          | ON           | ON           | ON           |
| 1280 KB  | OFF          | ON           | ON           | OFF          |
| 1408 KB  | OFF          | ON           | OFF          | ON           |
| 1536 KB  | OFF          | ON           | OFF          | OFF          |
| 1664 KB  | OFF          | OFF          | ON           | ON           |
| 1792 KB  | OFF          | OFF          | ON           | OFF          |
| 1920 KB  | OFF          | OFF          | OFF          | ON           |
| 2048 KB  | OFF          | OFF          | OFF          | OFF          |

\* Default setting.



**Figure A-1. Rampage 286 Conventional/Extended  
Memory Size.**

#### NOTE

If Rampage 286 is configured for all of its memory to be used as expanded memory (for example, switches SW2-1 through SW2-7 OFF) the above linear memory size settings will be ignored.

You can use the REX.SYS program to configure Rampage 286 expanded memory as extended memory without resetting Rampage 286 hardware switches. However, the reverse is not true: you cannot override the setting for conventional/extended memory size to allocate extended memory as expanded memory.

To reconfigure Rampage 286 expanded memory as extended memory without resetting board switches, use the INSTALL program (described in Section 4) to add or modify the DEVICE = REX.SYS statement in your CONFIG.SYS file.

## A.2 Base I/O Address

Figure A-2 shows the Rampage 286 base I/O address settings. This setting defines the base I/O address used by Rampage 286 to communicate with the computer so that it can make use of expanded memory.

If more than one AST expanded memory board is installed in a computer, each must use a different base I/O address. To prevent I/O address conflicts, make sure that no other devices in the computer uses the same base I/O address or associated I/O addresses.

### NOTE

When you select base I/O address 02x8h, Rampage 286 uses these associated addresses:

02x8h, 42x8h, 82x8h, C2x8h,  
02x9h, 42x9h, 82x9h, C2x9h

For example, selecting base I/O address 0208h causes the Rampage 286 board to use I/O addresses 0208h, 4208h, 8208h, C208h, 0209h, 4209h, 8209h, and C209h.

| Base I/O Address | SW1-5 | SW1-6 | SW1-7 | SW1-8 |
|------------------|-------|-------|-------|-------|
| 0208h            | ON    | ON    | ON    | ON    |
| * 0218h          | ON    | ON    | ON    | OFF   |
| 0258h            | ON    | OFF   | ON    | OFF   |
| 0268h            | ON    | OFF   | OFF   | ON    |
| 02A8h            | OFF   | ON    | OFF   | ON    |
| 02B8h            | OFF   | ON    | OFF   | OFF   |
| 02E8h            | OFF   | OFF   | OFF   | ON    |

\* Default setting

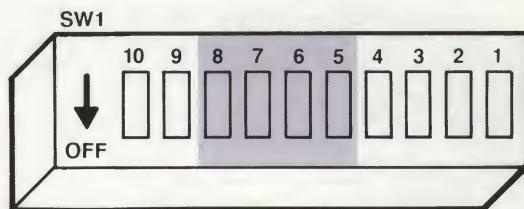


Figure A-2. Rampage 286 Base I/O Address Settings.

### A.3 Dual Page Mode

Figure A-3 shows how to enable or disable Dual Page mode. Dual Page mode allows expanded memory to maintain two sets of mapping registers, which ensures proper multitasking operation. Generally, Dual Page mode is left enabled.

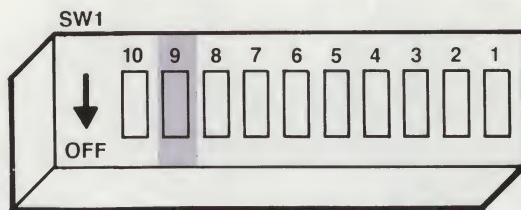


Figure A-3. Dual Page Mode Configuration.

## A.4 Conventional/Extended Memory Already Installed

Figure A-4 shows the possible Rampage 286 settings for conventional/extended (linear) memory already installed. This setting tells Rampage 286 how much conventional and extended memory is already installed in your computer, and prevents parity errors.

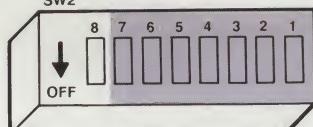
Please note that this parameter does not include the high memory between 640 KB and 1 MB. For example, if your computer includes 640 KB of conventional memory and 128 KB of extended memory, the setting for conventional/extended (linear) memory already installed is 768 KB (SW2-1 through SW2-4 ON, SW2-5 through SW2-7 OFF).

### NOTE

To allocate all Rampage 286 memory as expanded (paged) memory, simply set the conventional/extended memory already installed to 16 MB (SW2-1 through SW2-7 all OFF). If this is done, the settings for switches SW1-1 through SW1-4 are ignored.

## Switch Setting Summary

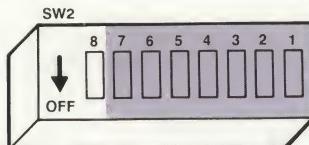
SW2



| Memory Already Installed | SW2-1 | SW2-2 | SW2-3 | SW2-4 | SW2-5 | SW2-6 | SW2-7 |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|
| 0 KB                     | ON    |
| 128 KB                   | ON    | ON    | ON    | ON    | ON    | ON    | OFF   |
| 256 KB                   | ON    | ON    | ON    | ON    | ON    | OFF   | ON    |
| 384 KB                   | ON    |
| 512 KB                   | ON    | ON    | ON    | ON    | OFF   | ON    | ON    |
| 640 KB                   | ON    | ON    | ON    | ON    | OFF   | ON    | OFF   |
| 768 KB                   | ON    | ON    | ON    | ON    | OFF   | OFF   | ON    |
| 896 KB                   | ON    | ON    | ON    | ON    | OFF   | OFF   | OFF   |
| 1024 KB                  | ON    | ON    | ON    | OFF   | ON    | ON    | ON    |
| 1152 KB                  | ON    | ON    | ON    | OFF   | ON    | ON    | OFF   |
| 1280 KB                  | ON    | ON    | ON    | OFF   | ON    | OFF   | ON    |
| 1408 KB                  | ON    | ON    | ON    | OFF   | ON    | OFF   | OFF   |
| 1536 KB                  | ON    | ON    | ON    | OFF   | OFF   | ON    | ON    |
| 1664 KB                  | ON    | ON    | ON    | OFF   | OFF   | ON    | OFF   |
| 1792 KB                  | ON    | ON    | ON    | OFF   | OFF   | OFF   | ON    |
| 1920 KB                  | ON    | ON    | ON    | OFF   | OFF   | OFF   | OFF   |
| 2048 KB                  | ON    | ON    | OFF   | ON    | ON    | ON    | ON    |
| 2176 KB                  | ON    | ON    | OFF   | ON    | ON    | ON    | OFF   |
| 2304 KB                  | ON    | ON    | OFF   | ON    | ON    | OFF   | ON    |
| 2432 KB                  | ON    | ON    | OFF   | ON    | ON    | OFF   | OFF   |
| 2560 KB                  | ON    | ON    | OFF   | ON    | OFF   | ON    | ON    |
| 2688 KB                  | ON    | ON    | OFF   | ON    | OFF   | ON    | OFF   |
| 2816 KB                  | ON    | ON    | OFF   | ON    | OFF   | OFF   | ON    |
| 2944 KB                  | ON    | ON    | OFF   | ON    | OFF   | OFF   | OFF   |
| 3072 KB                  | ON    | ON    | OFF   | OFF   | ON    | ON    | ON    |
| 3200 KB                  | ON    | ON    | OFF   | OFF   | ON    | ON    | OFF   |
| 3328 KB                  | ON    | ON    | OFF   | OFF   | ON    | OFF   | ON    |
| 3456 KB                  | ON    | ON    | OFF   | OFF   | ON    | OFF   | OFF   |
| 3584 KB                  | ON    | ON    | OFF   | OFF   | OFF   | ON    | ON    |
| 3712 KB                  | ON    | ON    | OFF   | OFF   | OFF   | ON    | OFF   |
| 3840 KB                  | ON    | ON    | OFF   | OFF   | OFF   | OFF   | ON    |
| 3968 KB                  | ON    | ON    | OFF   | OFF   | OFF   | OFF   | OFF   |
| 4096 KB                  | ON    | OFF   | ON    | ON    | ON    | ON    | ON    |
| 4224 KB                  | ON    | OFF   | ON    | ON    | ON    | ON    | OFF   |
| 4352 KB                  | ON    | OFF   | ON    | ON    | ON    | OFF   | ON    |
| 4480 KB                  | ON    | OFF   | ON    | ON    | ON    | OFF   | OFF   |
| 4608 KB                  | ON    | OFF   | ON    | ON    | OFF   | ON    | ON    |
| 4736 KB                  | ON    | OFF   | ON    | ON    | OFF   | ON    | OFF   |
| 4864 KB                  | ON    | OFF   | ON    | ON    | OFF   | OFF   | ON    |
| 4992 KB                  | ON    | OFF   | ON    | ON    | OFF   | OFF   | OFF   |
| 5120 KB                  | ON    | OFF   | ON    | OFF   | ON    | ON    | ON    |
| 5248 KB                  | ON    | OFF   | ON    | OFF   | ON    | ON    | OFF   |
| 5376 KB                  | ON    | OFF   | ON    | OFF   | ON    | OFF   | ON    |
| 5504 KB                  | ON    | OFF   | ON    | OFF   | ON    | OFF   | OFF   |
| 5632 KB                  | ON    | OFF   | ON    | OFF   | OFF   | ON    | ON    |
| 5760 KB                  | ON    | OFF   | ON    | OFF   | OFF   | ON    | OFF   |
| 5888 KB                  | ON    | OFF   | ON    | OFF   | OFF   | OFF   | ON    |
| 6016 KB                  | ON    | OFF   | ON    | OFF   | OFF   | OFF   | OFF   |
| 6144 KB                  | ON    | OFF   | OFF   | ON    | ON    | ON    | ON    |
| 6272 KB                  | ON    | OFF   | OFF   | ON    | ON    | ON    | OFF   |
| 6400 KB                  | ON    | OFF   | OFF   | ON    | ON    | OFF   | ON    |
| 6528 KB                  | ON    | OFF   | OFF   | ON    | ON    | OFF   | OFF   |
| 6656 KB                  | ON    | OFF   | OFF   | ON    | OFF   | ON    | ON    |
| 6784 KB                  | ON    | OFF   | OFF   | ON    | OFF   | ON    | OFF   |
| 6912 KB                  | ON    | OFF   | OFF   | ON    | OFF   | OFF   | ON    |
| 7040 KB                  | ON    | OFF   | OFF   | ON    | OFF   | OFF   | OFF   |
| 7168 KB                  | ON    | OFF   | OFF   | OFF   | ON    | ON    | ON    |
| 7296 KB                  | ON    | OFF   | OFF   | OFF   | ON    | ON    | OFF   |
| 7424 KB                  | ON    | OFF   | OFF   | OFF   | ON    | OFF   | ON    |
| 7552 KB                  | ON    | OFF   | OFF   | OFF   | ON    | OFF   | OFF   |
| 7680 KB                  | ON    | OFF   | OFF   | OFF   | OFF   | ON    | ON    |
| 7808 KB                  | ON    | OFF   | OFF   | OFF   | OFF   | ON    | OFF   |
| 7936 KB                  | ON    | OFF   | OFF   | OFF   | OFF   | OFF   | ON    |
| 8064 KB                  | ON    | OFF   | OFF   | OFF   | OFF   | OFF   | OFF   |

\* Default setting

**Figure A-4. Conventional/Extended Memory Already Installed.**



| Memory<br>Already<br>Installed | SW2-1 | SW2-2 | SW2-3 | SW2-4 | SW2-5 | SW2-6 | SW2-7 |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|
| 8192 KB                        | OFF   | ON    | ON    | ON    | ON    | ON    | ON    |
| 8320 KB                        | OFF   | ON    | ON    | ON    | ON    | ON    | OFF   |
| 8448 KB                        | OFF   | ON    | ON    | ON    | ON    | OFF   | ON    |
| 8576 KB                        | OFF   | ON    | ON    | ON    | ON    | OFF   | OFF   |
| 8704 KB                        | OFF   | ON    | ON    | ON    | OFF   | ON    | ON    |
| 8832 KB                        | OFF   | ON    | ON    | ON    | OFF   | ON    | OFF   |
| 8960 KB                        | OFF   | ON    | ON    | ON    | OFF   | OFF   | ON    |
| 9088 KB                        | OFF   | ON    | ON    | ON    | OFF   | OFF   | OFF   |
| 9216 KB                        | OFF   | ON    | ON    | OFF   | ON    | ON    | ON    |
| 9344 KB                        | OFF   | ON    | ON    | OFF   | ON    | ON    | OFF   |
| 9472 KB                        | OFF   | ON    | ON    | OFF   | ON    | OFF   | ON    |
| 9600 KB                        | OFF   | ON    | ON    | OFF   | ON    | OFF   | OFF   |
| 9728 KB                        | OFF   | ON    | ON    | OFF   | OFF   | ON    | ON    |
| 9856 KB                        | OFF   | ON    | ON    | OFF   | OFF   | ON    | OFF   |
| 9984 KB                        | OFF   | ON    | ON    | OFF   | OFF   | OFF   | ON    |
| 10112 KB                       | OFF   | ON    | ON    | OFF   | OFF   | OFF   | OFF   |
| 10240 KB                       | OFF   | ON    | OFF   | ON    | ON    | ON    | ON    |
| 10368 KB                       | OFF   | ON    | OFF   | ON    | ON    | ON    | OFF   |
| 10496 KB                       | OFF   | ON    | OFF   | ON    | ON    | OFF   | ON    |
| 10624 KB                       | OFF   | ON    | OFF   | ON    | ON    | OFF   | OFF   |
| 10752 KB                       | OFF   | ON    | OFF   | ON    | OFF   | ON    | ON    |
| 10880 KB                       | OFF   | ON    | OFF   | ON    | OFF   | ON    | OFF   |
| 11008 KB                       | OFF   | ON    | OFF   | ON    | OFF   | OFF   | ON    |
| 11136 KB                       | OFF   | ON    | OFF   | ON    | OFF   | OFF   | OFF   |
| 11264 KB                       | OFF   | ON    | OFF   | OFF   | ON    | ON    | ON    |
| 11392 KB                       | OFF   | ON    | OFF   | OFF   | ON    | ON    | OFF   |
| 11520 KB                       | OFF   | ON    | OFF   | OFF   | ON    | OFF   | ON    |
| 11648 KB                       | OFF   | ON    | OFF   | OFF   | ON    | OFF   | OFF   |
| 11776 KB                       | OFF   | ON    | OFF   | OFF   | OFF   | ON    | ON    |
| 11904 KB                       | OFF   | ON    | OFF   | OFF   | OFF   | ON    | OFF   |
| 12032 KB                       | OFF   | ON    | OFF   | OFF   | OFF   | OFF   | ON    |
| 12160 KB                       | OFF   | ON    | OFF   | OFF   | OFF   | OFF   | OFF   |
| 12288 KB                       | OFF   | OFF   | ON    | ON    | ON    | ON    | ON    |
| 12416 KB                       | OFF   | OFF   | ON    | ON    | ON    | ON    | ON    |
| 12544 KB                       | OFF   | OFF   | ON    | ON    | ON    | OFF   | ON    |
| 12672 KB                       | OFF   | OFF   | ON    | ON    | ON    | OFF   | OFF   |
| 12800 KB                       | OFF   | OFF   | ON    | ON    | OFF   | ON    | ON    |
| 12928 KB                       | OFF   | OFF   | ON    | ON    | OFF   | ON    | OFF   |
| 13056 KB                       | OFF   | OFF   | ON    | ON    | OFF   | OFF   | ON    |
| 13184 KB                       | OFF   | OFF   | ON    | ON    | OFF   | OFF   | OFF   |
| 13312 KB                       | OFF   | OFF   | ON    | OFF   | ON    | ON    | ON    |
| 13340 KB                       | OFF   | OFF   | ON    | OFF   | ON    | ON    | OFF   |
| 13568 KB                       | OFF   | OFF   | ON    | OFF   | ON    | OFF   | ON    |
| 13696 KB                       | OFF   | OFF   | ON    | OFF   | ON    | OFF   | OFF   |
| 13824 KB                       | OFF   | OFF   | ON    | OFF   | OFF   | ON    | ON    |
| 13952 KB                       | OFF   | OFF   | ON    | OFF   | OFF   | ON    | OFF   |
| 14080 KB                       | OFF   | OFF   | ON    | OFF   | OFF   | OFF   | ON    |
| 14208 KB                       | OFF   | OFF   | ON    | OFF   | OFF   | OFF   | OFF   |
| 14336 KB                       | OFF   | OFF   | OFF   | ON    | ON    | ON    | ON    |
| 14464 KB                       | OFF   | OFF   | OFF   | ON    | ON    | ON    | OFF   |
| 14592 KB                       | OFF   | OFF   | OFF   | ON    | ON    | OFF   | ON    |
| 14720 KB                       | OFF   | OFF   | OFF   | ON    | ON    | OFF   | OFF   |
| 14848 KB                       | OFF   | OFF   | OFF   | ON    | OFF   | ON    | ON    |
| 14976 KB                       | OFF   | OFF   | OFF   | ON    | OFF   | ON    | OFF   |
| 15104 KB                       | OFF   | OFF   | OFF   | ON    | OFF   | OFF   | ON    |
| 15232 KB                       | OFF   | OFF   | OFF   | ON    | OFF   | OFF   | OFF   |
| 15360 KB                       | OFF   | OFF   | OFF   | OFF   | ON    | ON    | ON    |
| 15488 KB                       | OFF   | OFF   | OFF   | OFF   | ON    | ON    | OFF   |
| 15616 KB                       | OFF   | OFF   | OFF   | OFF   | ON    | OFF   | ON    |
| 15744 KB                       | OFF   | OFF   | OFF   | OFF   | CN    | OFF   | OFF   |
| 15872 KB                       | OFF   | OFF   | OFF   | OFF   | OFF   | ON    | ON    |
| All RAMpage<br>memory<br>paged | OFF   |

Figure A-4 (Continued).

## A.5 Parity Checking

Figure A-5 shows how to enable or disable parity error checking. To ensure the most reliable memory operation, leave parity checking enabled.

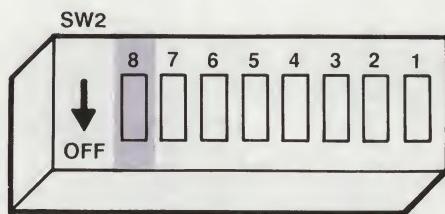


Figure A-5. Parity Error Checking.

## **MEMORY ALLOCATION FOR EEMS SOFTWARE**

---

**B**

For best performance with EEMS software, you may disable all or part of the system board's memory. For more instructions, see Section 3. See your EEMS application's user manual for specific memory requirements.

## NOTES

## ADDING OR REMOVING MEMORY

C

This section tells you how to install additional memory on Rampage 286. You can increase Rampage 286 memory to 2 megabytes (MB) by installing 256-kilobyte (KB) dynamic random access memory (DRAM) chips.

### C.1 Valid Memory Configurations

You must add or subtract Rampage 286 memory in 0.5 MB (512-KB) increments. The possible memory configurations are 0.5 MB, 1 MB, 1.5 MB, and 2 MB.

Figure C-1 shows the memory configurations.

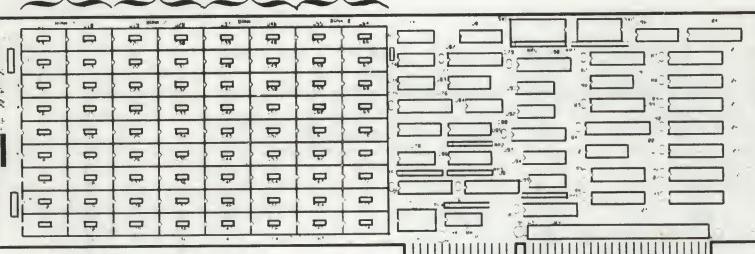
| Bank3  | Bank 2                     | Bank 1 | Bank 0 |
|--|----------------------------|--------|--------|
|  |                            |        |        |
| Amount of RAM  | Install RAM in these banks |        |        |
| 512 KB   | 0                          |        |        |
| 1 MB   | 0, 1                       |        |        |
| 1.5 MB   | 0, 1, 2                    |        |        |
| 2 MB   | 0, 1, 2, 3                 |        |        |

Figure C-1. Rampage 286 Memory Configuration.

## C.2 Memory Chip Specifications

Rampage 286 requires 256-KB DRAM chips which meet these specifications:

- Pin 1 not used.
- + 5 Volt only.

Depending on your computer, select SIMMs of these speeds:

- *For the IBM PC XT Model 286 and AT-compatible computers with 8 megahertz (MHz) bus speeds:* 120 nanoseconds (ns) or faster.
- *For the XT-compatible computers with the AST Xformer/286 replacement system board:* 100 ns or faster.

Table C-1 lists chips that are compatible with Rampage 286.

**Table C-1. Compatible 256-KB Memory Chips.**

| Manufacturer      | 120 ns       | 100 ns       |
|-------------------|--------------|--------------|
| Fujitsu           | MB81256-12P  | MB81256-10P  |
| Hitachi           | HM50256P-12  | HM50256P-10  |
| Micron            | MT1257-12    | MT1257-10    |
| Motorola          | MCM6256P-12  | MCM6256P-10  |
| NEC               | UPD41256C-12 | UPD41256C-10 |
| Samsung           | KM41256-12   | KM41256-10   |
| Texas Instruments | TMS4256-12NL | TMS4256-10NL |
| Toshiba           | TMM41256P-12 | TMM41256P-10 |

## C.3 Rules for Handling Memory Chips

Before you start installing chips into your Rampage 286 board, there are a few rules of which you must be aware. Following

these rules will prevent damage to your Rampage 286 board and computer:

- Use chips that meet the specifications in Section C.2.
- Fill each bank with the same type of memory chip. You cannot mix 256-KB DRAMs with other chips in the same bank.
- Add or subtract Rampage 286 memory in 512-KB increments, as shown in Section C.1.
- Before handling any chips, discharge any static electricity on your body by touching a grounded surface such as the computer chassis.
- Insert each chip so the notch or pin 1 indicator points left (See Figure C-2.)

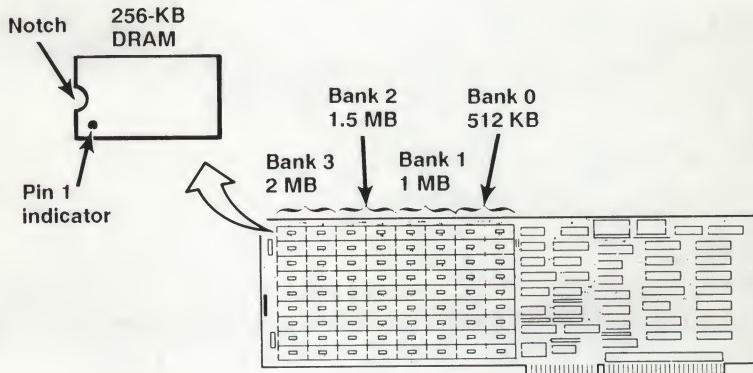


Figure C-2. Installing Rampage 286 Memory Chips.

- Be careful not to bend the chip's pins. If a chip seems too wide to fit in its socket, place it on its side on a flat surface and gently angle it under both thumbs to bend the legs inward.

- Remove a chip by prying it loose with a flathead screwdriver or chip extractor. Be careful not to damage the chip pins.
- You must run the SETUP and INSTALL programs whenever you add or remove Rampage 286 memory. Section 4 tells you how to run SETUP. For instructions on using INSTALL, see Section 5.

## C.4 Installing Additional Memory

Follow this procedure to install DRAM chips on your Rampage 286 board:

### **STEP 1**

*Remove the Rampage 286 board:* Shut off the power to the computer and remove the Rampage 286 board.

### **STEP 2**

*Install memory chips:* Install each bank of eighteen 256-KB DRAM chips in the next empty bank on the board.

Follow the guidelines in Section C.3 to install your memory chips carefully.

### **STEP 3**

*Set the Rampage 286 board switches:* If you want to increase the amount of linear (conventional and extended) memory on the Rampage 286, change switches SW1-1 through 1-4 to the appropriate settings. See Section 2 for instructions.

### **STEP 4**

*Reinstall the Rampage 286 board:* Follow the instructions in Section 3 to install the Rampage 286 in your computer.

### **STEP 5**

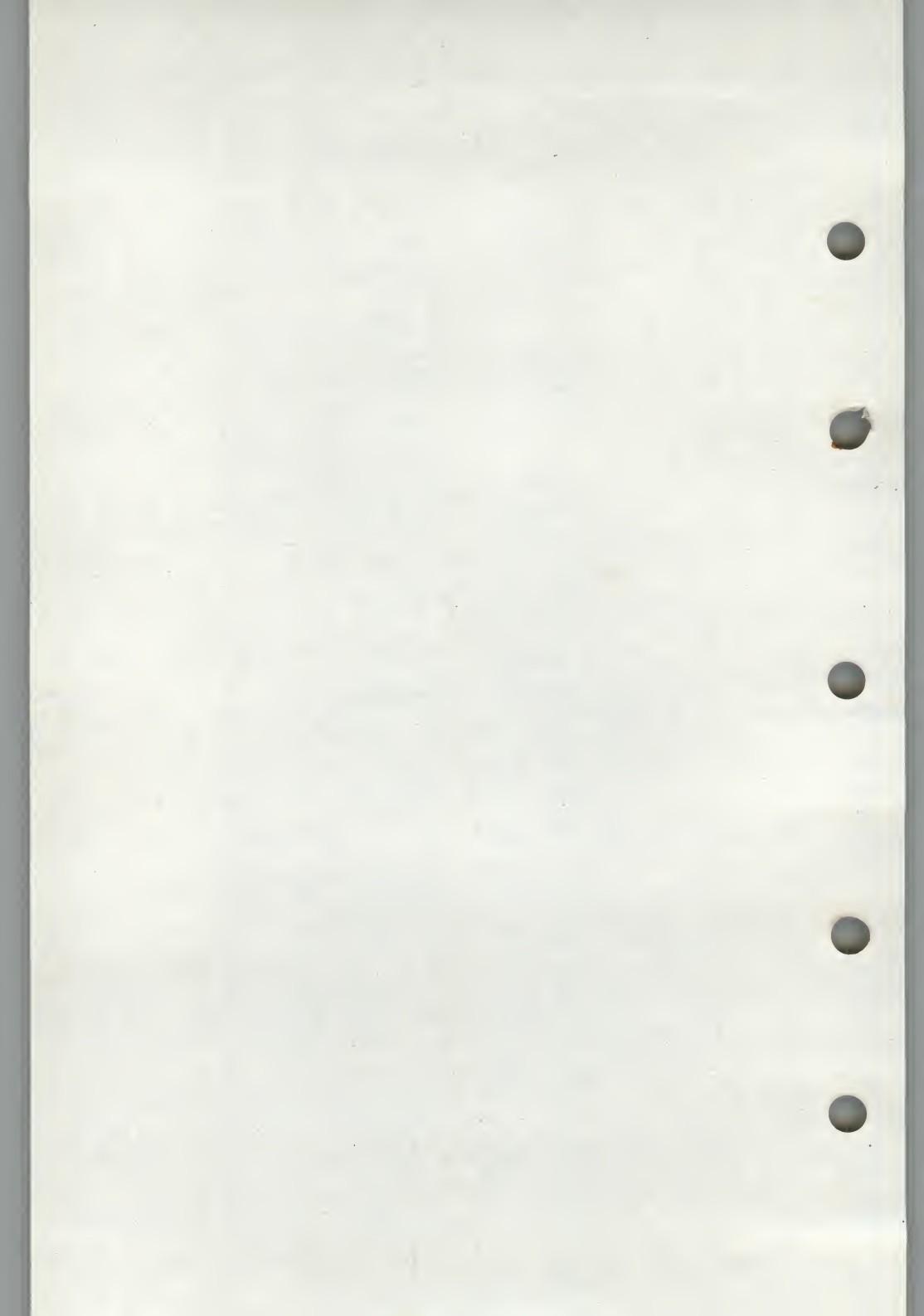
*Run the SETUP program:* You must run SETUP whenever you change the amount of linear memory in your computer. See Section 4 for instructions.

### **STEP 6**

*Run the INSTALL program:* To change the amount of expanded memory, or the size of the SuperPak utilities, run the INSTALL program as shown in Section 5.

## NOTES











000432-002 A

# RAMPAGE 286 JUMPER INSTRUCTIONS

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This instruction sheet summarizes the jumper settings necessary to install the Rampage® 286 memory expansion board in a Wyse® personal computer.

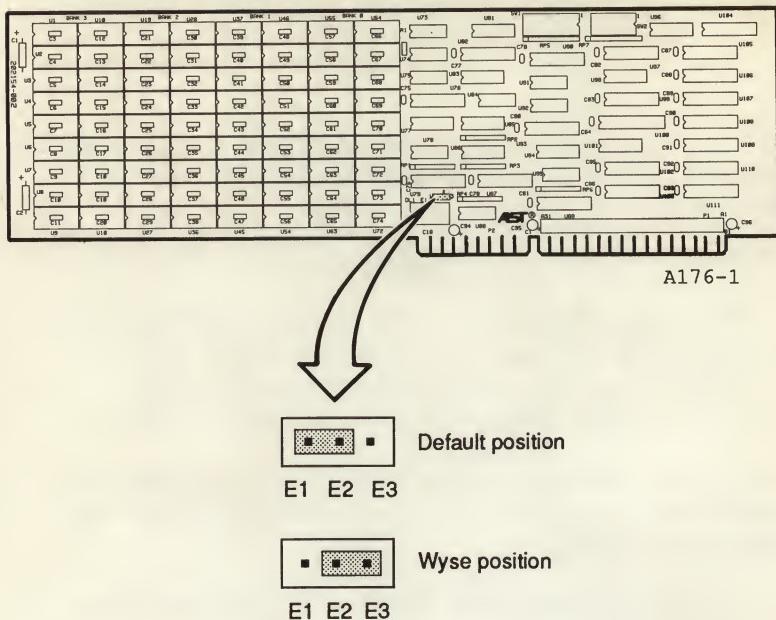
## NOTE

Rampage 286 has been certified to run in systems which operate at bus speeds of 8 megahertz (MHz). Rampage 286 has also been certified to operate with the AST Xformer/286™ system board at a bus speed of 10 MHz.

You should make one jumper change to your Rampage 286 memory expansion board before you install it in a Wyse 286 personal computer.

Configure the Rampage 286 board by relocating the jumper illustrated in Figure 1.

- If you are installing the Rampage 286 in a Wyse personal computer, remove the jumper from pins E1 and E2 and install it on pins E2 and E3.
- If you are installing the Rampage 286 board in other computers, leave the jumper on pins E1 and E2. Examples of acceptable models for this configuration are: IBM® PC AT®, PC XT Model 286, or an XT with an AST Xformer/286 system board installed.



**Figure 1. Rampage 286 E1-E3 Jumper.**

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# **Customer Service Supplement**

000857-001 A  
August 1988

**First Edition (August 1988)**

Changes are periodically made to the information contained in this publication; these changes will be incorporated into new editions.

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- *Product Service Tips:* If you have a problem with your AST product, read this section.
- *International Product Support:* If you are an international user, read this document to find the nearest AST subsidiary.
- *Bulletin Board System:* If you need technical product information, read this section.
- *Product Comment Form:* If you have suggestions or comments about an AST product or manual, complete this form and mail it in.

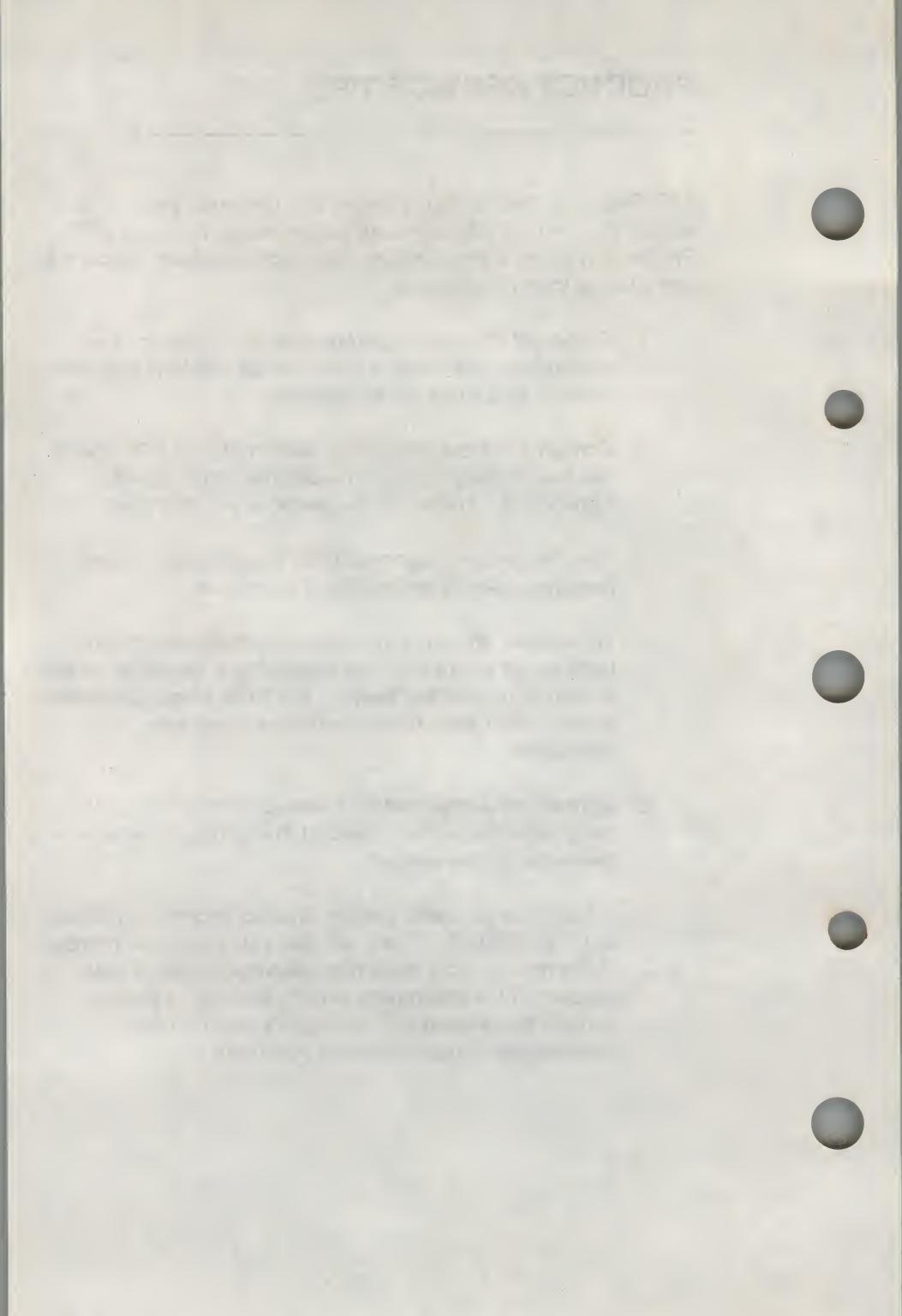


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AST Research has rigorously tested this computer product to ensure that you get the maximum performance from your AST Premium system. If you have any technical problems, follow the steps below to get assistance:

1. *Gather all information pertinent to your system:* You should have the product name, serial number, software version, and so on, as appropriate.
2. *Consult the Troubleshooting section of your AST user's manual for the product:* Troubleshooting is usually Appendix A. Follow the suggestions you find there.
3. *Run the system diagnostic tests if applicable:* These tests help identify and isolate the problem.
4. *Write down any error the diagnostic tests report:* The tests report errors either by displaying a message on the screen or by emitting beeps. The Error Message section in your AST user's manual explains these error messages.
5. *Contact the authorized AST reseller from whom you purchased the product.* Report the symptoms and error messages to the reseller.
6. *If this is not possible, call the Product Information Center at (714) 863-0181:* They will give you the phone number of the nearest AST authorized service center. If you purchased the equipment outside the United States, contact the nearest AST subsidiary listed on the International Product Support document.



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Contact the bulletin board by modem using the following parameters:

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- No parity
- Full duplex

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